ORDER NO. KM40002573C3

Service Manual

Telephone Equipment

Data Port

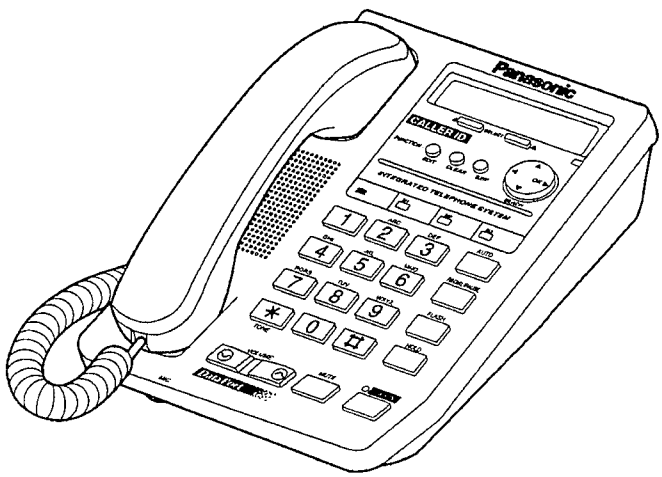
Caller ID Compatible

KX-TSC30BX-W

Integrated Telephone System

White Version

(for Asia, Middle Near and other areas)



SPECIFICATION

Power Source:	Telephone line voltage
Memory Capacity:	AC Adaptor KX-TCA1BX(AC 220-240V, 50/60Hz)
	informations of 50 different callers.
	Tone (DTMF) / Pulse (10 pps)
Dial Speed:	The unit redials the last 5 dialed number.
Redial:	Unit; 5.7 cm (2.5") PM magnetic
Speaker:	type receiver unit, 32 Ω
	Handset; 3 cm ($1^{3}/_{16}$") PM magnetic
	Electric condenser microphone
Microphone:	Telephone line, Data Port, DC IN
Input Jacks:	$6\ ^{23}/_{32}$" × $3\ ^{1}/_{2}$" × $8^{3}/_{4}$"
Dimensions:	[171 (W) × 89 (H) × 222 (D)mm]
	1.70 lb. (770g) with handset
Weight:	

Design and specifications are subject to change without notice.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

Panasonic

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KX-TSC30BX-W

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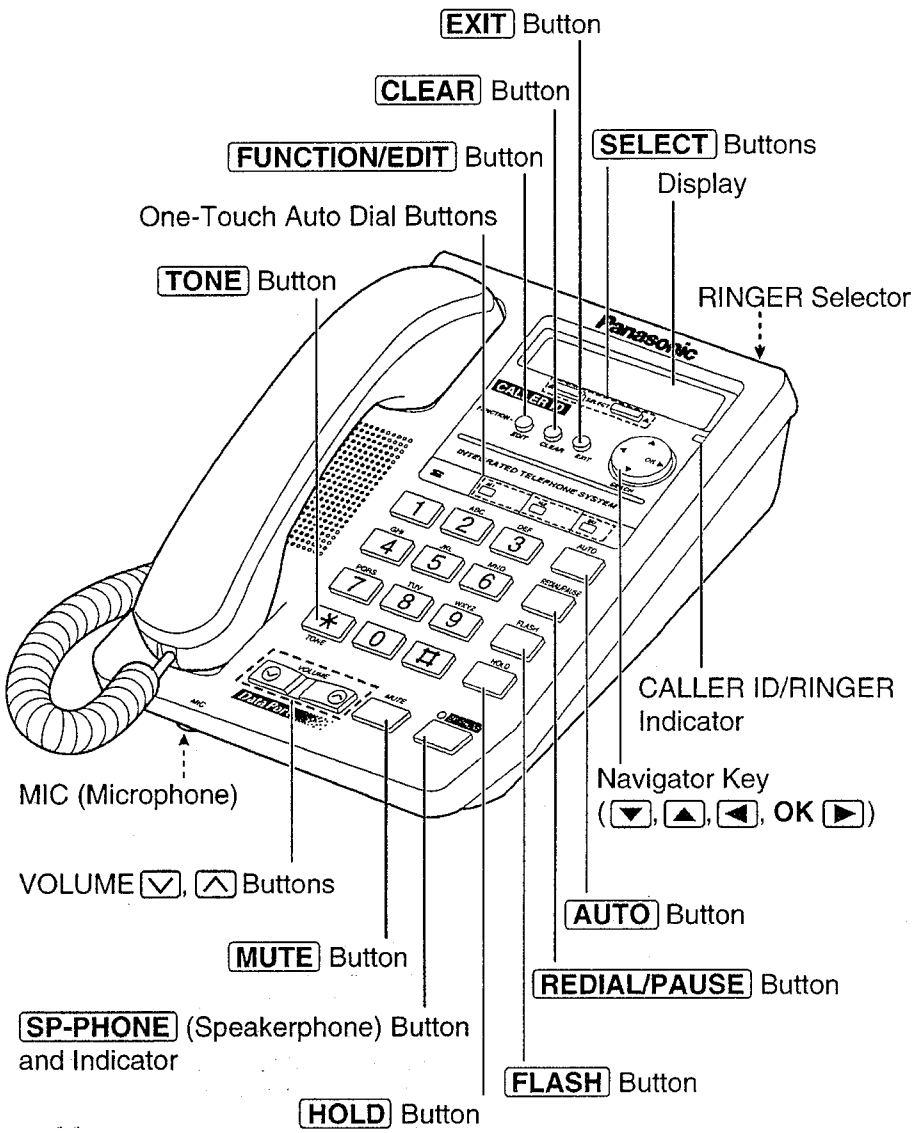
1 FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity. **When repairing, the following precautions will help prevent recurring malfunctions.**

1. Cover plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on worktable.
4. Do not grasp IC or LSI pins with bare fingers.

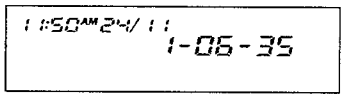
2 LOCATION OF CONTROLS



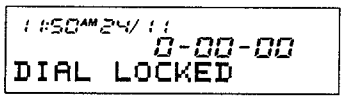
3 DISPLAY

In the stand-by mode, the display shows the current time and date, and the number of new calls.

If the display continuously shows "12:00AM 1/1" or "0:00 1/1", the clock needs adjusting.

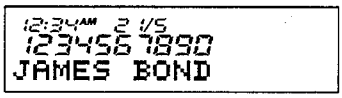


During a conversation, the display shows the length of the call (Ex. 1 hour, 6 minutes and 35 seconds).



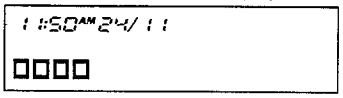
The dial lock mode is set.

The call restriction mode is set. (Ex. 0 is the restricted phone number.)

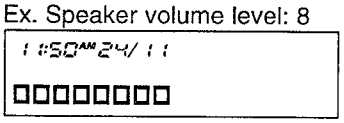


When a call is received, the display shows the caller's name and number while the unit is ringing.

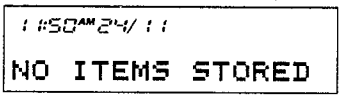
Ex. Handset volume level: 4



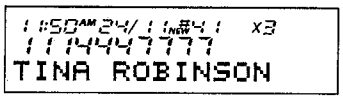
Ex. Speaker volume level: 8



The display shows the volume level.
You can select:
- —4 levels (1—4) while using the handset.
- —8 levels (1—8) while using the speakerphone.



The Caller List is empty.

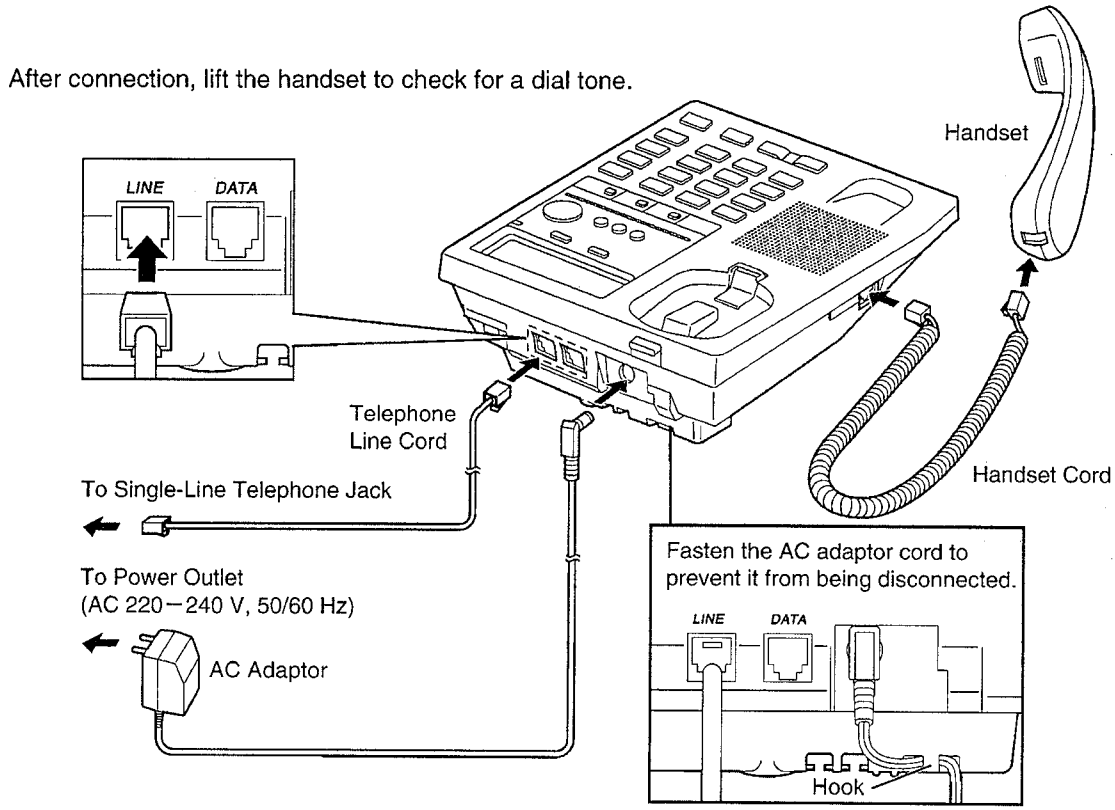


This is a display from the Caller List.
The display shows:
- —the time and date of the last call (Ex. Nov. 24, 11:50 AM),
- —the number of the call in the Caller List (Ex. #41),
- —the caller information is new and has not been viewed ("NEW" is displayed),
- —the number of times called (Ex. 3 times),
- —the caller's number and
- —the caller's name.

The name display service may not be available in some areas. For more information, please contact your telephone company.

4 CONNECTION

4.1. Connecting the Handset/AC Adaptor/Telephone Line Cord

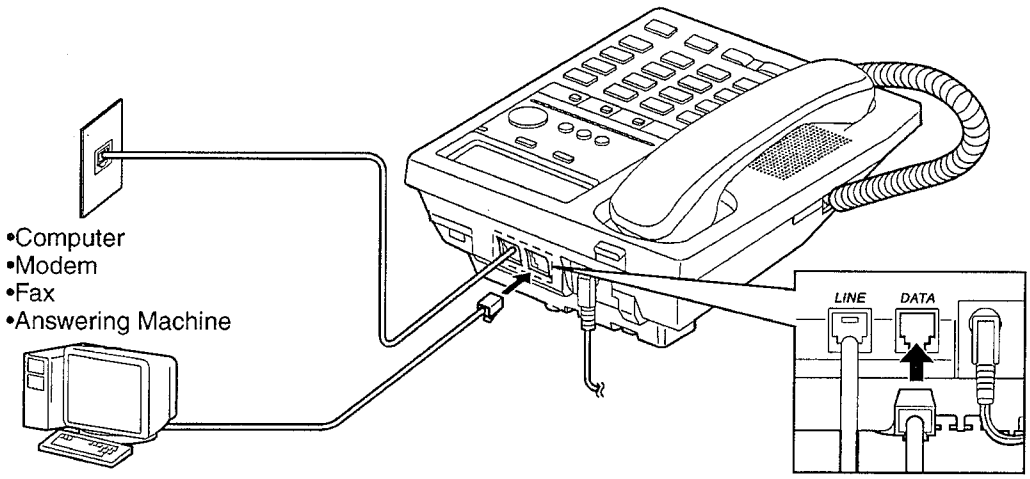


- USE ONLY WITH Panasonic AC ADAPTOR KX-TCA1BX.
- Use only a Panasonic Handset for the KX-TSC30BXW.
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.
- During a power failure the unit will work as an ordinary telephone, but the speakerphone will not work.

4.2. Connecting a Communication Device

If you connect a communication device (computer, modem, fax, answering machine, etc.) to the telephone line, you can connect it through this unit using the DATA jack (—**Data Port**).

After connecting the handset, AC adaptor and telephone line cord, connect the communication device telephone line cord to the DATA jack.



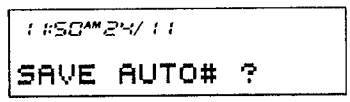
- Make sure the communication device is not in use before using this unit (making calls, storing phone numbers in memory etc.) or the communication device may not operate properly.

5 OPERATION

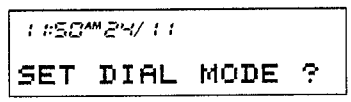
5.1. Selecting the Dialing Mode

You can select the dialing mode by programming. If you have touch tone service, set to "Tone". If rotary or pulse service is used, set to "Pulse". Your phone comes from the factory set to "Tone".
Make sure that the handset is on the cradle, the AC adaptor is connected and the SP-PHONE indicator light is off.

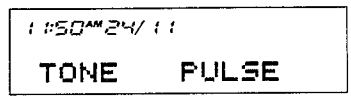
1 Press [FUNCTION/EDIT].



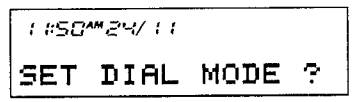
2 Press [▼] or [▲] repeatedly until "SET DIAL MODE ?" is displayed.



3 Press **OK** [►].



4 To select "Pulse", press [SELECT] (right button).
or
To select "Tone", press [SELECT] (left button).



- A beep sounds.
- The display will return to step 2. To return to the stand-by mode, press [EXIT] or wait for 60 seconds.

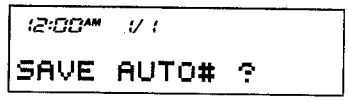
- You can exit the programming mode any time by pressing [EXIT].

KX-TSC30BX-W

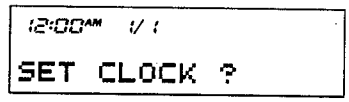
5.2. Time and Date Adjustment

You can select AM/PM or 24-hour clock by programming.
Make sure that the handset is on the cradle, the AC adaptor is connected and the SP-PHONE indicator light is off.

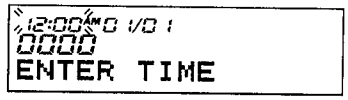
1 Press FUNCTION/EDIT.



2 Press ▼ or ▲ repeatedly until "SET CLOCK ?" is displayed.

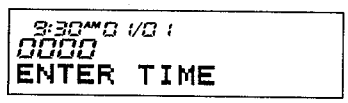


3 Press **OK** ►.



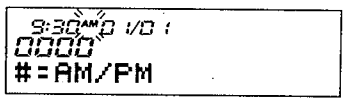
4 Enter the current time (hour and minute) using a 4-digit number.
(Ex. To set 9:30, enter "0930".)

- For AM/PM setting: Enter numbers between 0100 and 1259.
  For 24-hour clock: Enter numbers between 0000 and 2359.

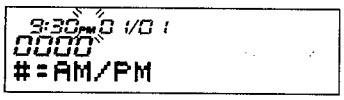


5 Press **OK** ►.

- If numbers between 0000 and 0059, or 1300 and 2359 are entered, the time will automatically be set using the 24-hour clock. Skip the steps 6 and 7 and go to the step 8.



6 Press # to select "AM", "PM" or 24-hour clock.
(Ex. You select "PM".)

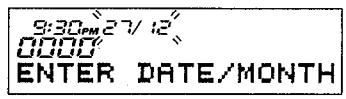


Display	Option
AM	AM
PM	PM
(Blank display)	24-hour clock

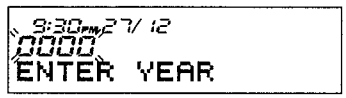
Each time you press #, the selection will change on the display.

7 Press **OK** [▶].

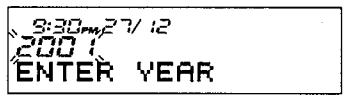
8 Enter the current day and month using a 4-digit number.
(Ex. To set Dec. 27, enter "2712".)



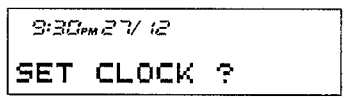
9 Press **OK** [▶].



10 Enter the current year using a 4-digit number.
(Ex. To set the year 2001, enter "2001".)
- You can set the year 2000 to 2099.



11 Press **OK** [▶] (SAVE key).
- A beep sounds.
- The clock starts working.
- The display will return to step 2. To return to the stand-by mode, press [EXIT] or wait for 60 seconds.



- You can go back to the previous screen by pressing [◀], when setting the time and date.
- If 3 beeps sound when entering the time and date, the time and date entered are not correct. Enter the correct time and date.

If a power failure occurs or the AC adaptor is disconnected for more than about 30 minutes, the time and date will be shown as "12:00AM 1/1" or"0:00 1/1". Readjust the date/time.

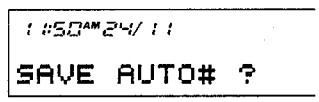
For Caller ID service users

If a time display service is available with the Caller ID service:
- The Caller ID information will re-set the clock after the ring if the adjusted time and/or date is incorrect. However, if the time has not previously been set, the Caller ID information will not adjust the clock.

5.3. Setting the LCD Contrast

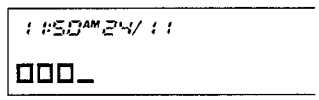
You can select the LCD contrast level from 1 to 4 by programming. Your phone comes from the factory set to 3.
Make sure that the handset is on the cradle, the AC adaptor is connected and the SP-PHONE indicator light is off.

1 Press [FUNCTION/EDIT].



2 Press [▼] or [▲] repeatedly until "LCD CONTRAST ?" is displayed.

3 Press **OK** [▶].
The current setting is displayed.



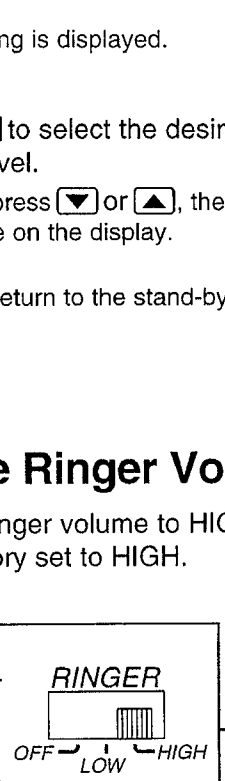
4 Press [▼] or [▲] to select the desired LCD contrast level.
•Each time you press [▼] or [▲], the level will change on the display.

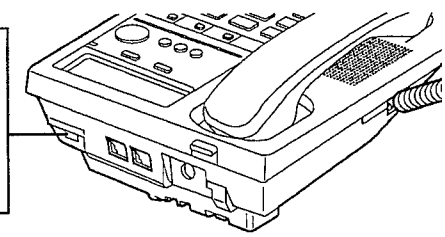
5 Press [EXIT] to return to the stand-by mode.

Selecting the Ringer Volume

You can select the ringer volume to HIGH, LOW or OFF. Your phone comes from the factory set to HIGH.

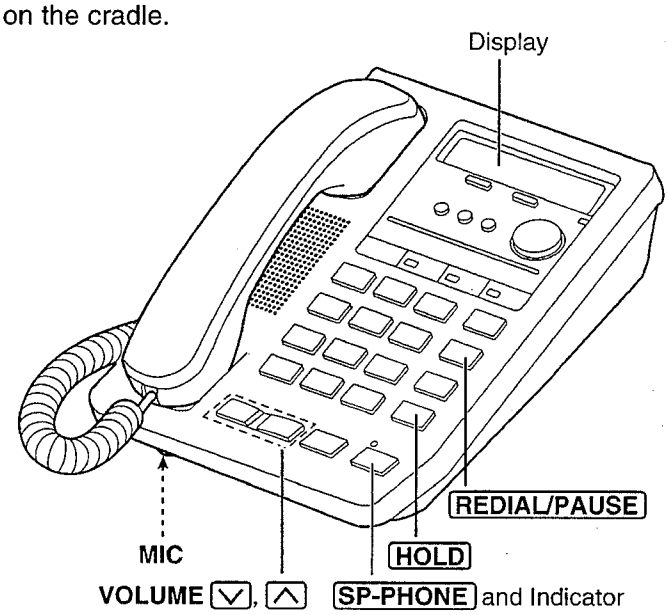
RINGER Selector:
Set to HIGH, LOW or OFF.
•When set to OFF, the unit will not ring.





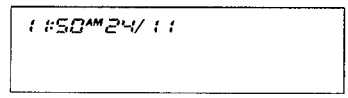
5.4. Making Calls

You can make a call by simply lifting the handset. To hang up, place the handset on the cradle.

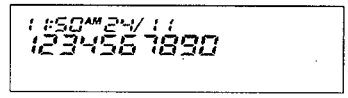


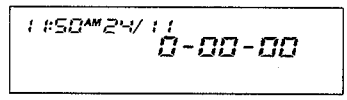
Using the speakerphone

1 Press **SP-PHONE**.
The indicator lights.



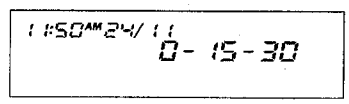
2 Dial a phone number.
- The dialed number is displayed.
- After a few seconds, the display will show the length of the call.
- If you misdial, hang up and start again from step 1.





3 When the other party answers, talk into the **MIC** (microphone).

4 To hang up, press **SP-PHONE**.
- The indicator light goes out.
- The display will return to the stand-by mode.



- If a power failure occurs during a call with the speakerphone, you will not hear the caller's voice. The call is automatically put on hold for 1 minute, and you can resume the call with the handset.

To redial the last number dialed

Using the handset: Lift the handset ➡ press **REDIAL/PAUSE**.

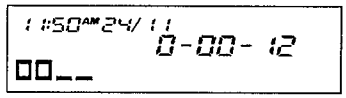
Using the speakerphone: Press **SP-PHONE** ➡ press **REDIAL/PAUSE**.

Automatic Redial:
When using the speakerphone, the unit redials the last dialed number up to 15 times within a 10-minute period if the line is busy. During redial, "WAITING REDIAL" will be displayed and the SP-PHONE indicator light ashes.

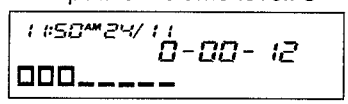
To adjust the handset volume (4 levels) or the speaker volume (8 levels) while talking

To increase, press **VOLUME** [▽]. To decrease, press **VOLUME** [△].

Ex. Handset volume level: 2



Ex. Speaker volume level: 3



•The display shows the volume level for a few seconds.

To put a call on hold

Press [HOLD].

•The SP-PHONE indicator light ashes.
•After about 10 minutes, the call will be disconnected.
•"HOLD" is displayed.
•If using the handset, you can place it on the cradle.

To release the hold

If the handset is on the cradle, lift the handset.
If the handset is off the cradle, press [HOLD].
If using the speakerphone, press [SP-PHONE].

•If another phone is connected on the same line, you can also release the hold by lifting its handset.

During speakerphone operation
For best performance, please note the following:
Talk alternately with the other party in a quiet room.
If the other party has difficulty hearing you, press [VOLUME] to decrease the speaker volume.
You can switch to the handset by lifting it up. To switch back to the speakerphone, press [SP-PHONE].

5.5. Answering Calls

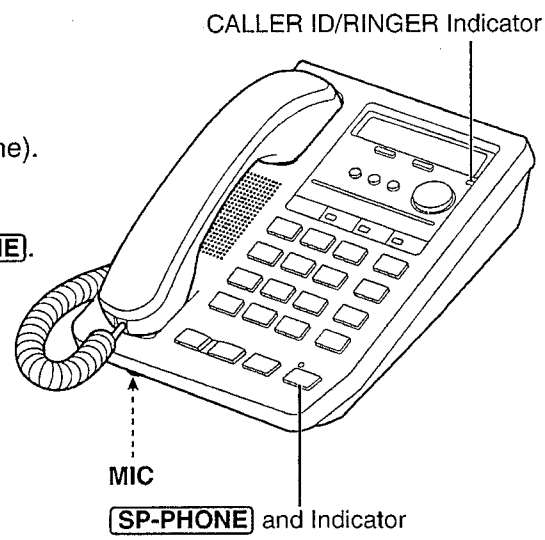
When a call is received, the unit rings, the CALLER ID/RINGER indicator flashes quickly and "INCOMING CALL" is displayed. You can answer a call by simply lifting the handset.
If you subscribe to a Caller ID service, the calling party's information will be displayed when the unit is ringing.

Using the speakerphone

1 Press [SP-PHONE].
•The indicator lights.

2 Talk into the **MIC** (microphone).

3 To hang up, press [SP-PHONE].
•The indicator light goes out.



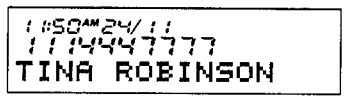
•When the ringer volume is set to OFF, the unit will not ring.

5.5.1. Caller ID Service

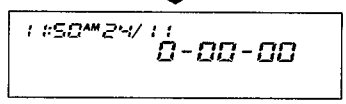
This unit is compatible with a Caller ID service offered by your telephone company. If you subscribe to a Caller ID service, the calling party's information will be displayed when the unit is ringing.
The unit can record information of up to 50 different callers, including the time and date received and the number of times called, in the Caller List. The Caller List information is sorted from the most recent to the oldest call. When the 51st call is received, the oldest call is deleted.
Using the list, you can automatically call back a caller. You can store the callers' numbers from the Caller List in the Speed Dialer memory or the One-Touch Dialer memory.

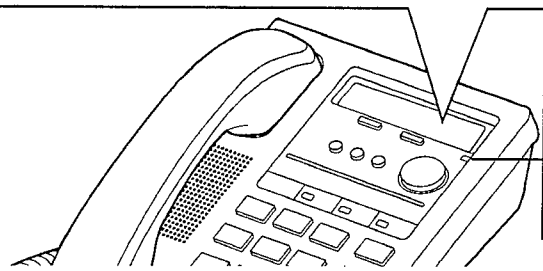
How caller information is displayed when a call is received

The display shows the calleres name and number when the unit is ringing.



After you answer the call, the display will show the length of the call.





The CALLER ID/RINGER indicator will flash quickly when a call is being received.

Caller information will not be displayed in the following cases:
- —If the caller dialed from an area which does not provide a Caller ID service, the display will show "OUT OF AREA".
- —If the caller has requested not to display his/her information, the display will show "PRIVATE CALLER".
- —If a long distance call cannot be identified, " LDC " will be displayed.

•If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.

- •If a power failure occurs, Caller ID services will not be available.
- •The name display service may not be available in some areas. For more information, please contact your telephone company.

To check the number of new calls

The display shows the number of new calls in the stand-by mode.

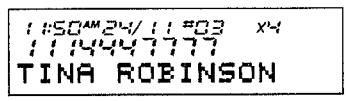
For example, if you have received 10 new calls, the display on the right will be shown.

The CALLER ID/RINGER indicator will flash slowly when new calls have been received.

5.6. Viewing the Caller List

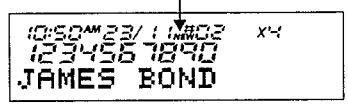
To check who has called, follow the steps below.

1 Press ▼ or ▲ to enter the list.
- The display will show the most recent caller information.

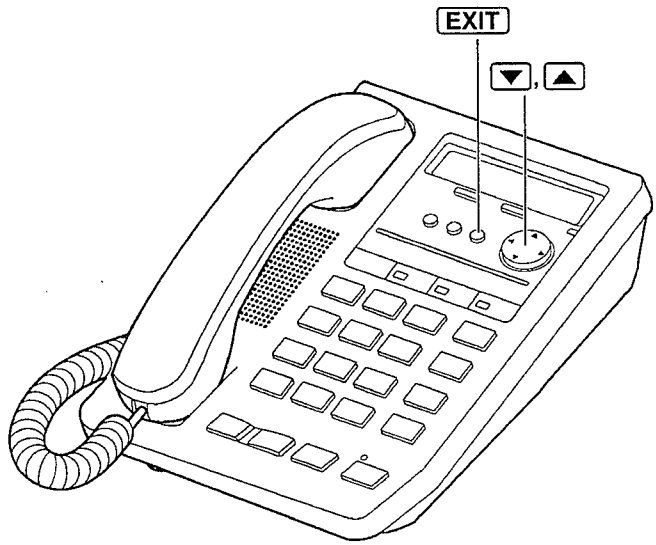


2 To search from the most recent call, press ▼.
To search from the oldest call, press ▲.
- To scroll between callers, press ▼ or ▲.
- To return to the stand-by mode, press EXIT or wait for 60 seconds.

"NEW" display

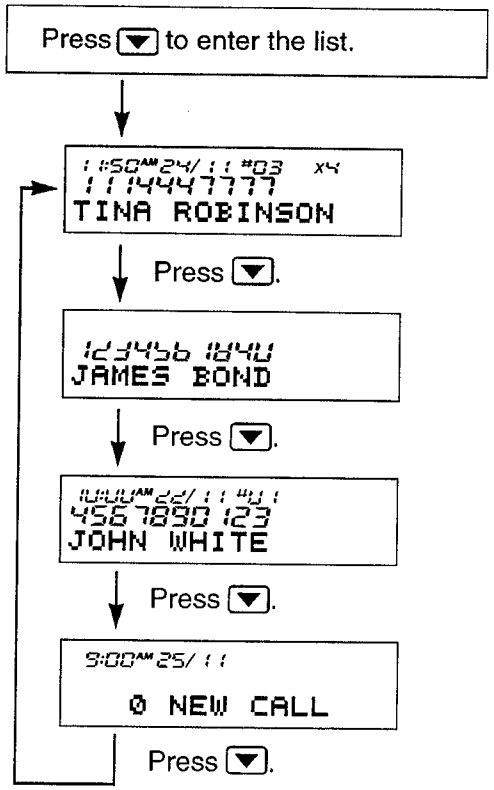


3 To exit the list, press EXIT.
- The display will return to the stand-by mode.



- Once NEW calls have been checked, "NEW" will disappear from the display.
- If "NO ITEMS STORED" is displayed in step 1, the Caller List is empty.
- If more than one call is received from the same caller, the date and time of the most recent call will be recorded.

Ex. When you search from the most recent call:



- If there is no name information for a caller, the display will only show the phone number.

To return to the previous caller, press ▲.

To exit the Caller List, press **(EXIT).**

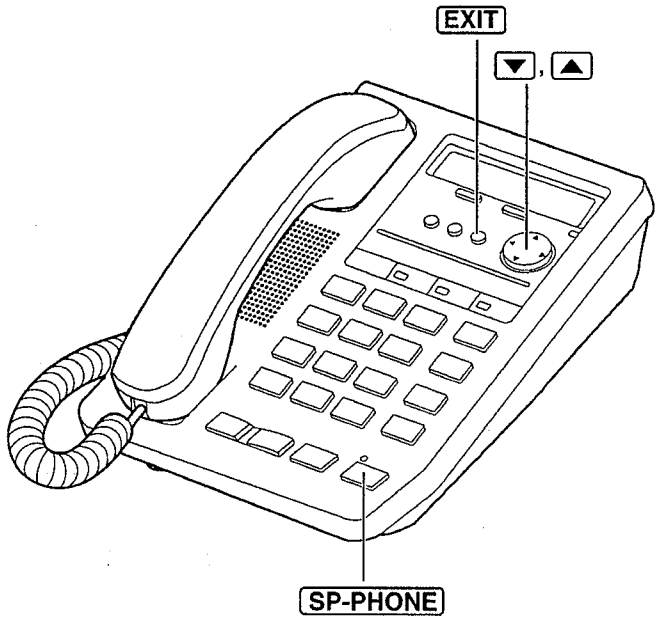
- The display will return to the stand-by mode.

Display meaning:

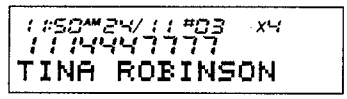
NEW : You have not checked the caller information, answered the call or called back the caller.

X2–X9 : The number of times the same caller called (up to 9).

5.7. Calling Back from the Caller List

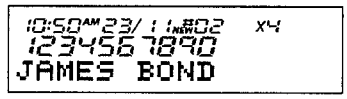


1 Press ▼ or ▲ to enter the list.



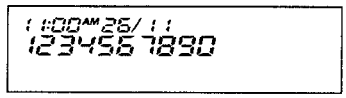
2 Press ▼ or ▲ repeatedly to find the desired caller.

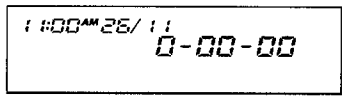
- To return to the stand-by mode, press EXIT or wait for 60 seconds.



3 Lift the handset or press SP-PHONE.

- The displayed phone number is dialed automatically.
- After a few seconds, the display will show the length of the call.



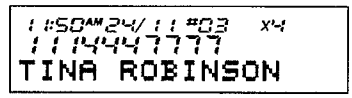


- In some cases, you may have to edit the number before dialing.
- If a phone number is not displayed in the caller information, you cannot call back that caller.

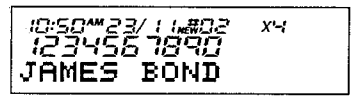
5.8. Editing a Caller's Phone Number

You can edit a phone number recorded in the Caller List.

1 Press [▼] or [▲] to enter the list.

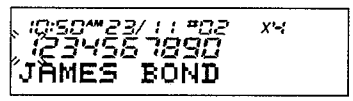


2 Press [▼] or [▲] repeatedly to find the desired caller.

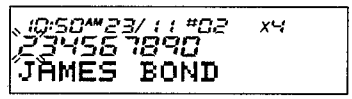


3 Press [FUNCTION/EDIT] to edit a phone number.

- The number furthest to the left will flash.

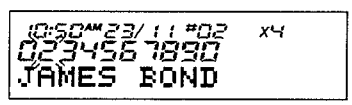


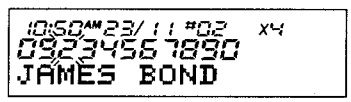
4 Press [CLEAR] to delete the number.



5 Insert the required numbers ([0] to [9]).
(Ex. "0" and "9" is entered.)

- If you enter a wrong number, press [CLEAR] and enter the correct number.





6 After editing the number, you can continue with calling back or storing procedures.
To call back, lift the handset or press [SP-PHONE].

6 DISASSEMBLY INSTRUCTIONS

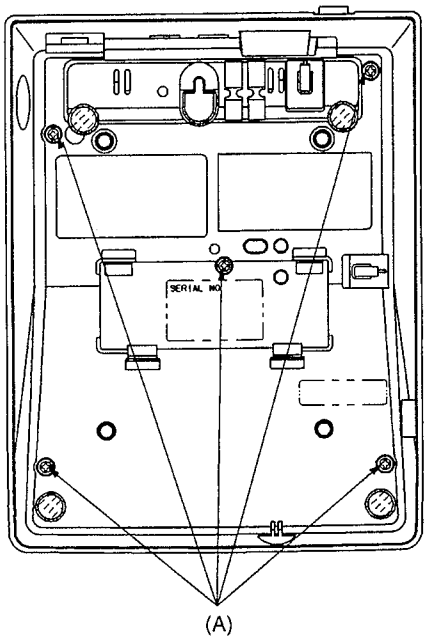


Fig. 1

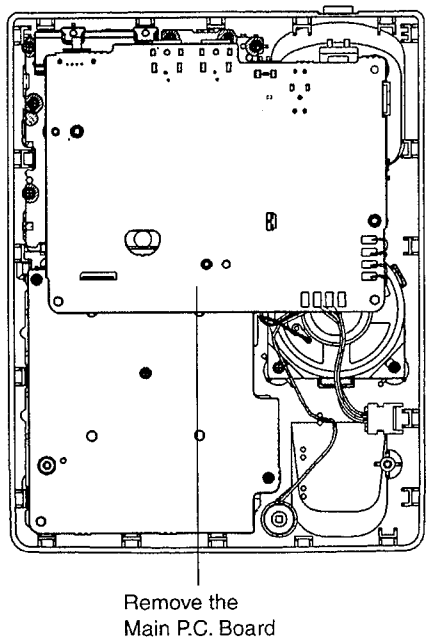


Fig. 2

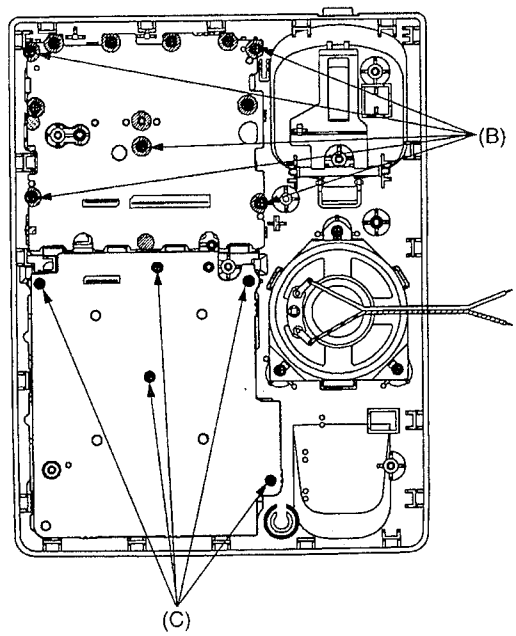


Fig. 3

Shown in Fig.-	To remove-.	Remove-.
1	Lower Cabinet	Screws (2.6 × 14) ..... (A) × 5
2	Main Printed Circuit Board	Remove the Main P.C. Board
3	LCD Printed Circuit Board	Screws (2.6 × 8) ..... (B) × 5
3	Operation Printed Circuit Board	Screws (2.6 × 8) ..... (C) × 5

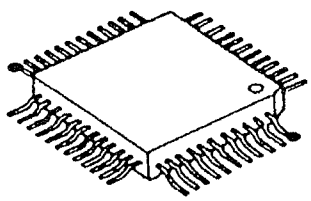
7 HOW TO REPLACE FLAT PACKAGE IC

7.1. PREPARATION

- SOLDER
  Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19,KR-19RMA
- Soldering iron
  Recommended power consumption will be between 30 W to 40 W.
  Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
  (An expert may handle between 60 W to 40 W iron, but beginner might damage foil by overheating.)
- Flux
  HI115 Specific gravity 0.863
  (Original flux will be replaced daily.)

7.2. PROCEDURE

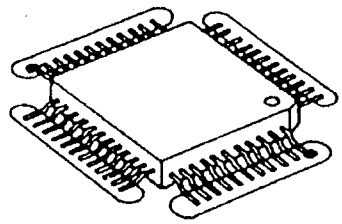
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.

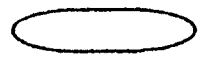


● - - - - - -Temporary soldering point.

*Most important matter is accurate setting of IC to the corresponding soldering foil.

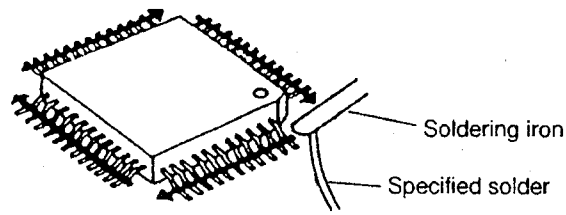
2. Apply flux for all pins of FLAT PACKAGE IC.





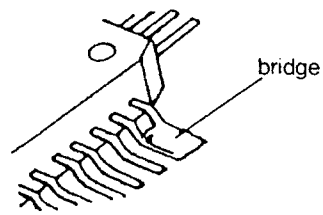
- - - - - -Flux

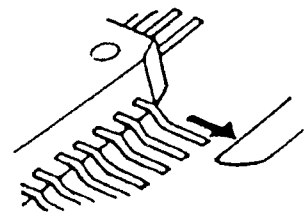
3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



7.3. MODIFICATION PROCEDURE OF BRIDGE

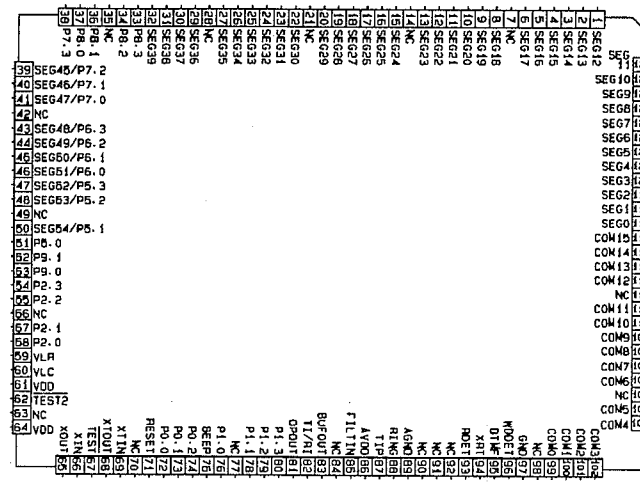
1. Re-solder slightly on bridged portion.
2. Remove remained solder along pins employing soldering iron as shown in below figure.





8 CPU DATA

8.1. IC101



Pin	Description	I/O	High	Low	High-Z
1	SEG12	O	-	-	-
2	SEG13	O	-	-	-
3	SEG14	O	-	-	-
4	SEG15	O	-	-	-
5	SEG16	O	-	-	-
6	SEG17	O	-	-	-
7	NC	-	-	-	-
8	SEG18	O	-	-	-
9	SEG19	O	-	-	-
10	SEG20	O	-	-	-
11	SEG21	O	-	-	-
12	SEG22	O	-	-	-
13	SEG23	O	-	-	-
14	NC	-	-	-	-
15	SEG24	O	-	-	-
16	SEG25	O	-	-	-
17	SEG26	O	-	-	-
18	SEG27	O	-	-	-
19	SEG28	O	-	-	-
20	SEG29	O	-	-	-
21	NC	-	-	-	-
22	SEG30	O	-	-	-
23	SEG31	O	-	-	-
24	SEG32	O	-	-	-
25	SEG33	O	-	-	-
26	SEG34	O	-	-	-
27	SEG35	O	-	-	-
28	NC	-	-	-	-
29	SEG36	O	-	-	-
30	SEG37	O	-	-	-
31	SEG38	O	-	-	-
32	SEG39	O	-	-	-
33	(LINE SEIZURE)	I/O	ON	OFF	-
34	VOL3	I/O	Volume down	Normal	-
35	NC	-	-	-	-
36	VOL2	I/O	Volume down	Normal	-
37	VOL1	I/O	Volume down	Normal	-
38	SP_CS	I/O	SP ON	SP OFF	-
39	PULSE	I/O	MAKE	BREAK	-
40	DTMF_RCV PD	I/O	Power down	Normal	-
41	DTMF_RCV CLK	I/O	Active	Normal	-
42	NC	-	-	-	-
43	DTMF_RCV STD	I/O	Received	Normal	-
44	DIAL TONE	I/O	No	Dial Tone	-
45	EX-HOOK	I/O	OFF-HOOK	Normal	-
46	AC DOWN	I/O	Normal	Down	-
47	TX-MUTE	I/O	MUTE ON	MUTE OFF	-
48	RX-MUTE	I/O	MUTE ON	MUTE OFF	
49	NC	-	-	-	-
50	OPT-STR/LOAD	I/O	Normal	Active	-
51	OPT-STR	I/O	Normal	Active	-
52	SP-PHONE LED	O	-	ON	OFF
53	CALLER ID LED	O	-	ON	OFF
54	Key IN	I/O	No	Key In	-
55	Key IN	I/O	No	Key In	-
56	NC	-	-	-	-
57	Key IN	I/O	No	Key In	-
58	Key IN	I/O	No	Key In	-
59	VLR	O	-	-	-
60	VLCD	I	-	-	-
61	POWER SUPPLY	-	-	-	-
62	TESTPIN	I	-	-	-
63	NC	-	-	-	-
64	POWER SUPPLY	-	-	-	-

Pin	Description	I/O	High	Low	High-Z
65	Main clock	O	-	-	-
66	Main clock	I	-	-	-
67	Test Pin	I	NORMAL	TEST	-
68	Sub clock	O	-	-	-
69	Sub clock	I	-	-	-
70	NC	-	-	-	-
71	RESET	I	RESET	NORMAL	-
72	EEPROM CLK	I/O	NORMAL	ACTIVE	-
73	EEPROM DI	I/O	DATA	DATA	-
74	EEPROM DOUT	I/O	NORMAL	ACTIVE	-
75	BEEP	I/O	ACTIVE	NORMAL	-
76	HOOK DET	I/O	OFF-HOOK	ON-HOOK	-
77	NC	-	-	-	-
78	EEPROM CS	I/O	OFF	ON	-
79	RELAY	I/O	ON	OFF	-
80	DTMF SD	I/O	DATA	DATA	-
81	OPOUT	O	-	-	-
82	TI/RI	I	-	-	-
83	BUFOUT	O	-	-	-
84	NC	-	-	-	-
85	FILTIN	I	-	-	-
86	AVDD	-	-	-	-
87	TIP	I	-	-	-
88	RING	I	-	-	-
89	ANALOG GND	-	-	-	-
90	NC	-	-	-	-
91	NC	-	-	-	-
92	NC	-	-	-	-
93	BELL IN	I	-	-	-
94	BELL DET	O	-	-	-
95	DTMF	O	-	-	-
96	Not used	I/O	-	-	-
97	GND	-	-	-	-
98	NC	-	-	-	-
99	COM0/ROW0	O	-	-	-
100	COM1/ROW1	O	-	-	-
101	COM2/ROW2	O	-	-	-
102	COM3/ROW3	O	-	-	-
103	COM4/ROW4	O	-	-	-
104	COM5/ROW5	O	-	-	-
105	NC	-	-	-	-
106	COM6/ROW6	O	-	-	-
107	COM7/ROW7	O	-	-	-
108	COM8	I/O	-	-	-
109	COM9	I/O	-	-	-
110	COM10	I/O	-	-	-
111	COM11	I/O	-	-	-
112	NC	-			
113	COM12	I/O	-	-	-
114	COM13	I/O	-	-	-
115	COM14	I/O	-	-	-
116	COM15	I/O	-	-	-
117	SEG0	O	-	-	-
118	SEG1	O	-	-	-
119	SEG2	O	-	-	-
120	SEG3	O	-	-	-
121	SEG4	O	-	-	-
122	SEG5	O	-	-	-
123	SEG6	O	-	-	-
124	SEG7	O	-	-	-
125	SEG8	O	-	-	-
126	SEG9	O	-	-	-
127	SEG10	O	-	-	-
128	SEG11	O	-	-	-

8.1.1. Pin Description

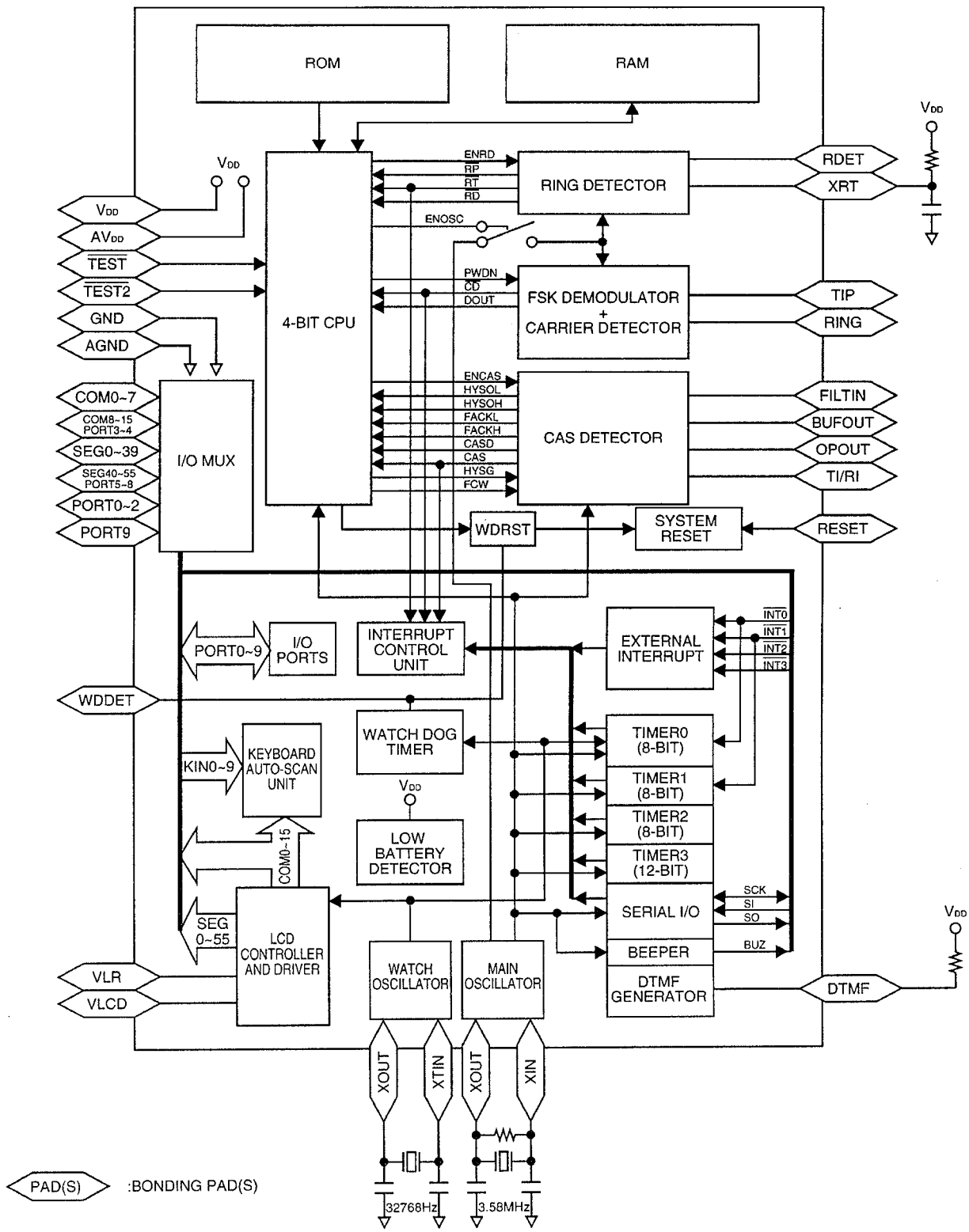
Pad No.	Designation	I/O	Description
1~28	SEG12~39	O	LCD segment signal outputs
29~32	SEG40~43 / P8.3~0	O I/O	LCD segment signal outputs / Port8
33~36	SEG44~47 / P7.3~0	O I/O	LCD segment signal outputs / Port7
37~40	SEG48~51 / P6.3~0	O I/O	LCD segment signal outputs / Port6
41~44	SEG52~55 / P5.3~0	O I/O	LCD segment signal outputs / Port5
45~46	LED1, LED0 / P9.1, 9.0	O	LED driving pins / Port9, These pins are N-channel open drain output.
47~50	KIN3~0 ($\overline{INT2}$)/ P2.3~0	I I/O	Keyboard interrupt inputs ($\overline{INT2}$) / Port2
51	VLR	O	Output pin for LCD reference voltage
52	VLCD	I	Input pin for LCD reference voltage
53	VDD	P	Power supply input. Should be decoupled to GND by a capacitor mounted close to the device pin.
54	$\overline{TEST2}$	I	Enable TEST MODE 2 when low (For factory used only)
55	VDD	P	This pad should be connected to VDD.
56	XOUT	O	Main oscillator output
57	XIN	I	Main oscillator input
58	$\overline{TEST}$	I	Enable TEST MODE 1 when low (For factory used only)
59	XTOUT	O	Watch crystal oscillator output
60	XTIN	I	Watch crystal oscillator input
61	RESET	I	System reset input (High active)
62	SCK / P0.0	I/O I/O	Serial clock I/O / Port0.0
63	SI / P0.1	I I/O	Serial data input / Port0.1
64	SO P0.2	O I/O	Serial data output / Port0.2
65	BUZ / P0.3	O I/O	Buzzer output (Normal low) / Port0.3
66	$\overline{INT0}$ / P1.0	I I/O	External interrupt input ($\overline{INT0}$)/ Port1.0
67	$\overline{INT1}$ / P1.1	I I/O	External interrupt input ($\overline{INT1}$)/ Port1.1
68	P1, 2	I/O	Port1.2
69	$\overline{INT3}$ / P1.3	I I/O	External interrupt input ($\overline{INT3}$) / PORT1.3

8.1.2. Pin Description (continuous)

Pad No.	Designation	I/O	Description
70	OPOUT	O	Output of TI/RI input OP Amp
71	TI/RI	I	Tip in or Ring in should be connected with twisted pair
72	BUFOUT	O	Internal buffer output
73	FILTIN	I	Band pass filter input
74	AVDD	P	Analog power supply input. Should be decoupled to AGND by a capacitor mounted close to the device pin
75	TIP	I	TIP line input pin
76	RING	I	Ring line input pin
77	AGND	P	Analog ground
78	NC	-	No Connection
79	NC	-	No Connection
80	RDET	I	Ring detected input pin
81	XRT	O	Ring detected output pin (open drain, low active)
82	DTMF	O	DTMF signal output pin
83	WDDET	I/O	Output: watch dog status detecting pin Input: disable watch dog timer while low
84	GND	P	Ground
85~92	COM0~7	O	LCD common signal outputs (Keyboard scanning outputs)
93~96	COM8~11 / P3.0~3 / $\overline{INT2}$	O I/O I	LCD common signal outputs / Port 3 / Keyboard interrupt inputs ($\overline{INT2}$)
97~100	COM12~15 / P4.0~3	O I/O	LCD common signal outputs / Port 4
101~112	SEG0~11	O	LCD segment signal outputs

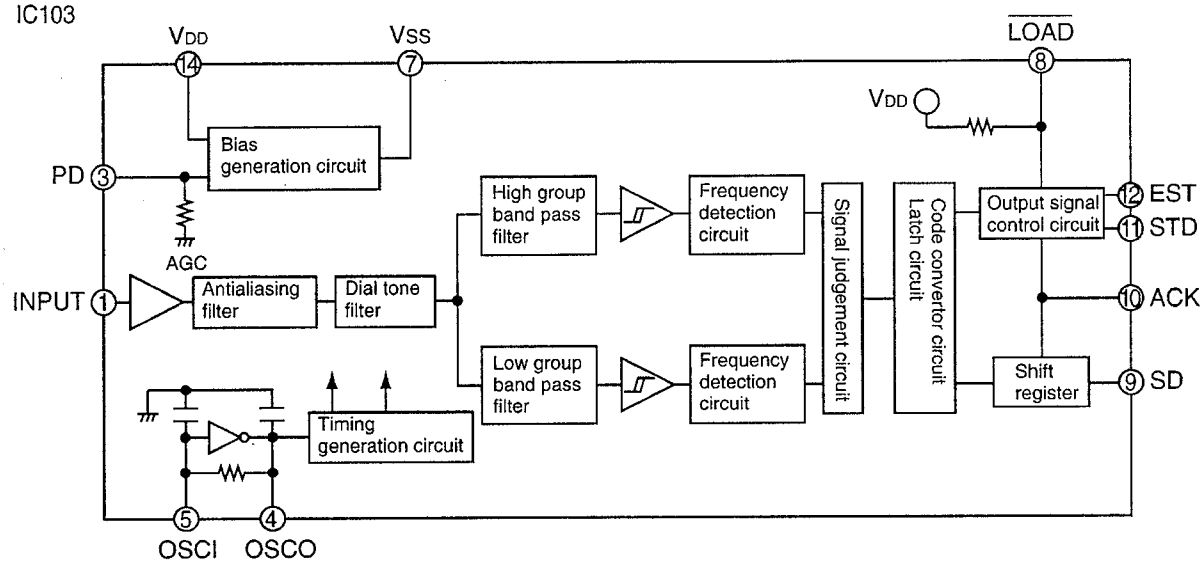
Note:
All external interrupt inputs would be triggered by any negative-edge signal

8.1.3. Block Diagram



9 DTMF RECEIVER IC DATA

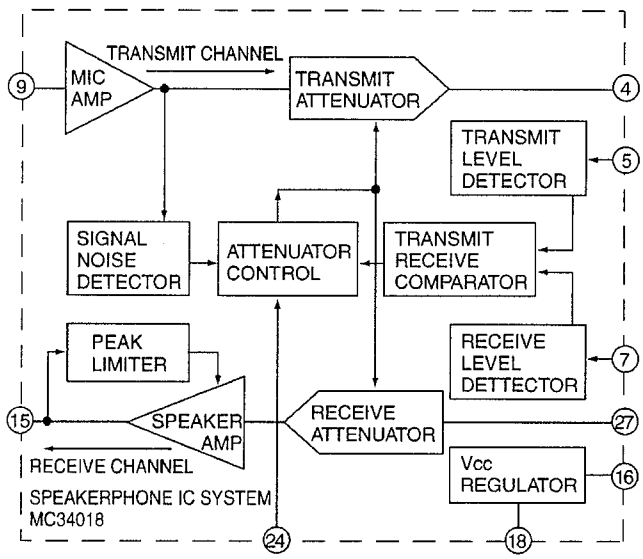
IC103



Pin Description

Pin No.	Name	I/O	Description
1	INPUT	I	The input coupling capacitor is required. The input terminal is biased by VDD/2 inside of the IC.
2	NC		The terminal should be opened.
3	PD	I	Setting this pin "H" causes the IC to enter power down mode. Also "H" should be kept for 1µs or more when the power is turned ON.
4	OSCO	O	The oscillator or capacitor (if necessary) should be connected between these terminals to compose the oscillation circuit. (Consult the oscillator manufacturer whether the external capacitor is required or not.)
5	OSCI	I	
6	NC		The terminal should be opened.
7	VSS		The power supply terminal is normally 0V.
8	$\overline{\text{LOAD}}$	I	When the clock is input, the output of the serial data from the second time is allowed.
9	SD	O	The decoded DTMF is output as the serial data of 4 bit following the LSB.
10	ACK	I	The ACK pin is used to output the data to SD pin. 4 pulses are necessary to output the DTMF consisting of 4bit. The rising edge of the first pulse latches the data to the shift register before shifting.
11	STD	O	"H" indicates the existence of DTMF signal. This pin is set to "H" when the EST pin kept "H" for about 30 ms, and set to "L" when EST pin kept "H" for about 20 ms by the built-in digital guard timer.
12	EST	O	"H" indicates the existence of DTMF signal. This pin is monitored from outside, and after a proper time is elapsed, 4 pulses are sent to the ACK to access the data.
13	NC		The terminal should be opened.
14	VDD		The power supply terminal is normally 4.5 to 5.5 V.

10 SPERAKEPHONE IC DATA



IC5

Pin NO.	Name	Description
1	RR	A resistor to ground provides a reference current for the transmit and receive attenuators.
2	RTX	A resistor to ground determines the nominal gain of the transmit attenuator. The transmit channel gain is inversely proportional to the RTX resistance.
3	TXI	Input to the transmit attenuator. Input resistance is nominally 5.0 kohms.
4	TXO	Output to the transmit attenuator. The TXO output signal drives the input of the transmit level detector, as well as the external circuit which drives the telephone line.
5	TLI	Input of the transmit level detector. An external resistor ac coupled to the TLI pin sets the detection level. Decreasing this resistor increases the sensitivity to transmit channel signals.
6	TLO	Output of the transmit level detector. An external resistor and capacitor set the time the comparator will hold the system in the transmit mode after speech ceases.
7	RLI	Input of the receive level detector. An external resistor ac coupled to the RLI pin sets the detection level. Decreasing this resistor increases the sensitivity to receive channel signals.
8	RLO	Output of the receive level detector. An external resistor and capacitor set the time the comparator will hold the system in the receive mode after the receive signal ceases.
9	MCI	Microphone amplifier input. Input impedance is nominally 10 kohms and the dc bias voltage is approximately equal to VB.
10	MCO	Microphone amplifier output. The mic amp gain is internally set at 34 dB (50 V/V).
11	CP1	A parallel resistor and capacitor connected between this pin and Vcc holds a voltage corresponding to the background noise level. The transmit detector compares the CP1 voltage with the speech signal from CP2.
12	CP2	A capacitor at this pin peak detects the speech signals for comparison with the background noise level held at CP1.
13	XDI	Input to the transmit detector system. The microphone amplifier output is ac coupled to the XDI pin through an external resistor.
14	SKG	High current ground pin for the speaker amp output stage. The SKG voltage should be within 10 mV of the ground voltage at pin 22.
15	SKO	Speaker amplifier output. The SKO pin will source and sink up to 100 mA when ac coupled to the speaker. The speaker amp gain is internally set at 34 dB (50 V/V).
16	V+	Input dc supply voltage. V+ can be powered from Tip and Ring if an ac decoupling inductor is used to prevent loading ac line signals. The required V+ voltage is 6.0 to 11 V (7.5 V nominal) at 7.0 mA.
17	AGC	A capacitor from this pin to VB stabilizes the speaker amp gain control loop, and additionally controls the attack and decay time of this circuit. The gain control loop limits the speaker amp input to prevent clipping at SKO. The internal resistance at the AGC pin is nominally 110 kohms.
18	$\overline{CS}$	Digital chip select input. When at a Logic "0" (<0.7 V) the Vcc regulator is enabled. When at a Logic "1" (>1.6 V), the chip is in the standby mode drawing 0.5 mA. An open $\overline{CS}$ pin is a Logic "0". Input impedance is nominally 140 kohms. The input voltage should not exceed 11 V.
19	SKI	Input to the speaker amplifier. Input impedance is nominally 20 kohms.
20	Vcc	A 5.4 V regulated output which powers all circuit expect the speaker amplifier output stage. Vcc can be used to power external circuitry such as a microprocessor (3.0 mA max). A filter capacitor is required. The MC 34018 can be powered by a separate regulated supply by connecting V+ and Vcc to a voltage between 4.5 V and 6.5 V while maintaining $\overline{CS}$ at a Logic "1".
21	VB	An output voltage equal to approximately Vcc/2 which serves as an analogue ground for the speakerphone system. Up to 1.5 mA of external load current may be sourced from VB. Output impedance is 250 ohms. A filter capacitor is required.
22	Gnd	Ground pin for the IC (except the speaker amplifier).
23	XDC	Transmit detector output. A resistor and capacitor at this pin hold the system in the transmit mode during pauses between words or phrases. When the XDC pin voltage decays to ground, the attenuators switch from the transmit mode to the idle mode. The internal resistor at XDC is nominally 2.6 kohms.
24	VLC	Volume control input. Connecting this pin to the slider of a variable resistor provides receive mode volume control. The VLC pin voltage should be less than or equal to VB.
25	ACF	Attenuator control filter. A capacitor connected to this pin reduces noise transients as the attenuator control switches levels of attenuation.
26	RXO	Output of the receive attenuator. Normally this pin is ac coupled to the input of the speaker amplifier.
27	RXI	Input of the receive attenuator. Input resistance is nominally 5.0 kohms.
28	RRX	A resistor to ground determines the nominal gain of the receive attenuator. The receive channel gain is directly proportional to the RRX resistance.

11 TERMINAL GUIDE OF ICS, TRANSISTORS AND DIODES

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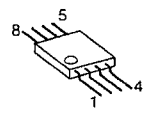
<td> 

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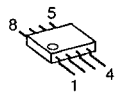
<td> 

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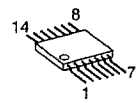
<td> 

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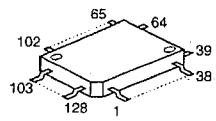
<td> 

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 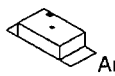

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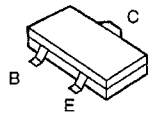
<td colspan="2"> 

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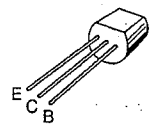
<td> 

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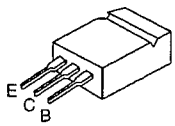
<td> 

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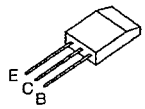
<td> 

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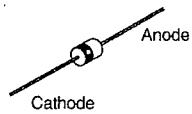
<td> 

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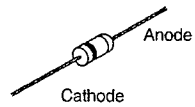
<td> 

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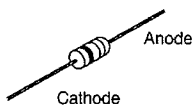
<td> 

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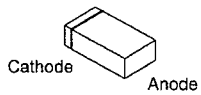
<td> 

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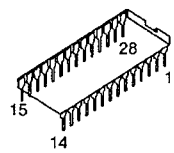
<td> 

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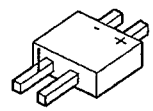
<td> 

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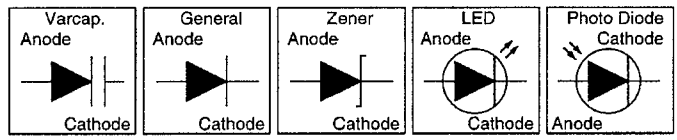
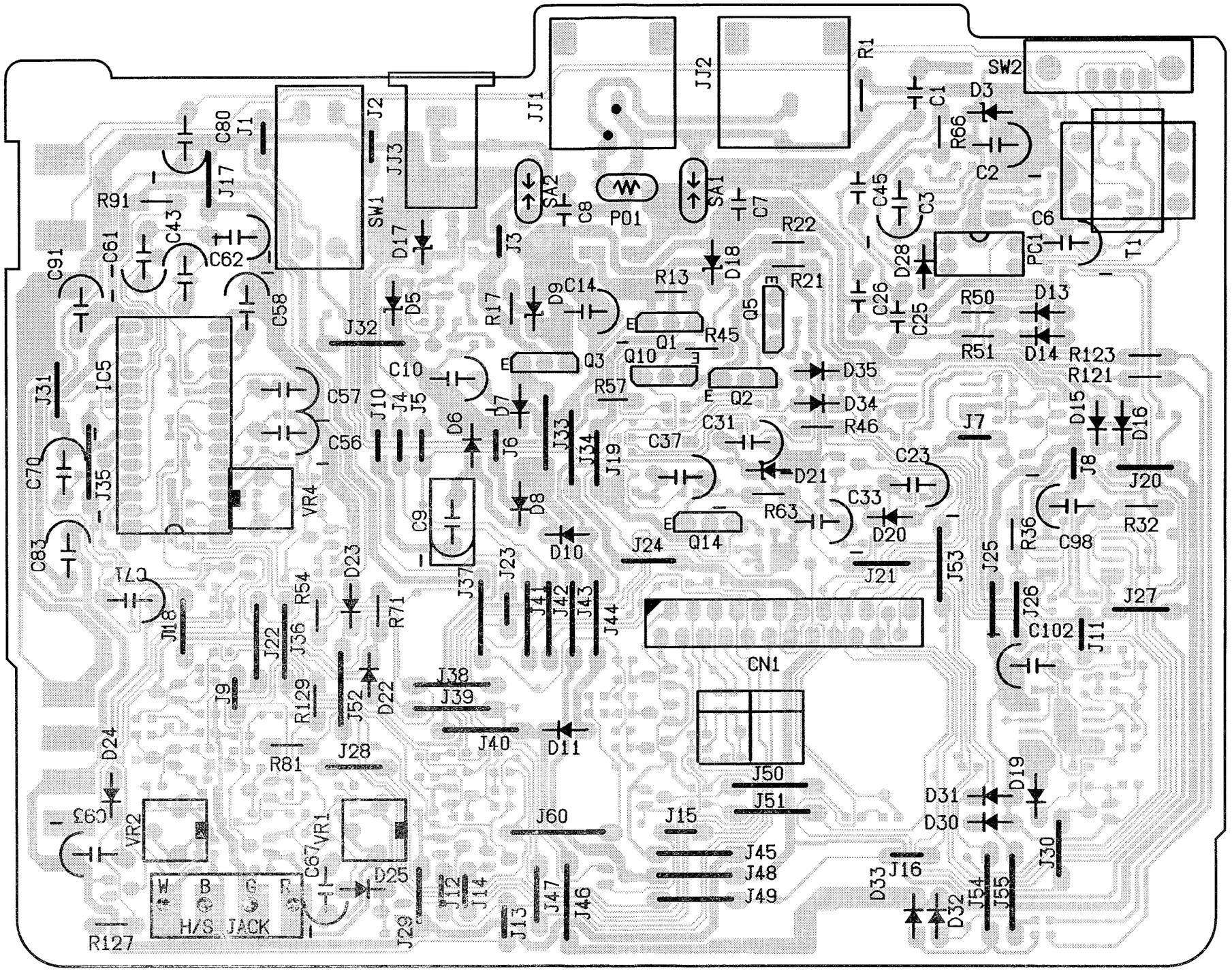
12 FOR SCHEMATIC DIAGRAM [pages 31, 35]

1. SW1: Hook switch.
2. SW2: Ringer selector.
3. DC voltage measurements are taken with electronic voltmeter from negative voltage line.
4. (Add 40 mA to telephone line from the loop simulator.)
5. Off-hook condition
6. No Mack: Handset Mode
7. This schematic diagram may be modified at any time with the development of new technology.
8. **The shades area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.**
9. **When servicing, it is essential that only manufacture's specified parts be used for the critical components in the shaded areas of the schematic.**

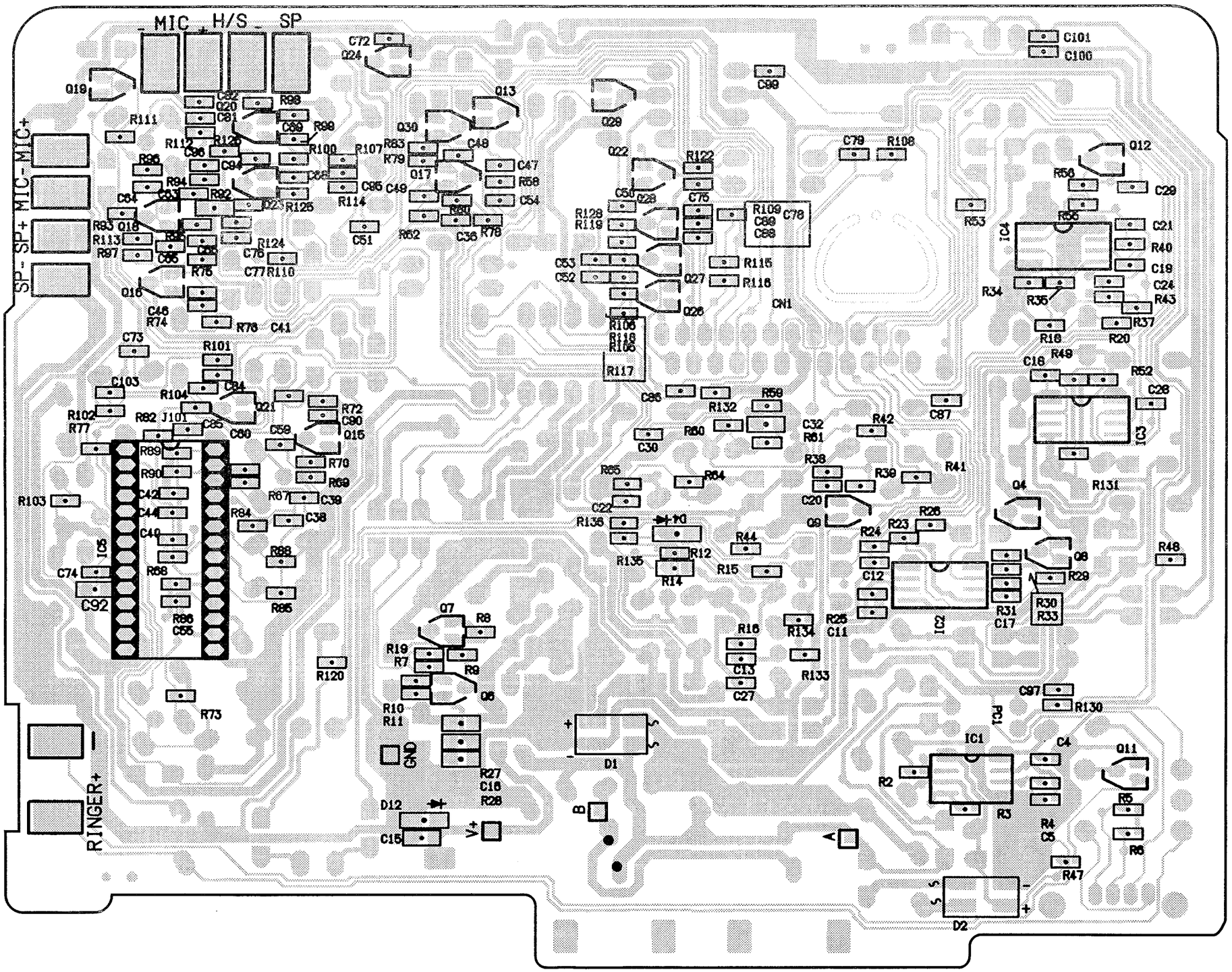


13 PRINTED CIRCUIT BOARD (MAIN)

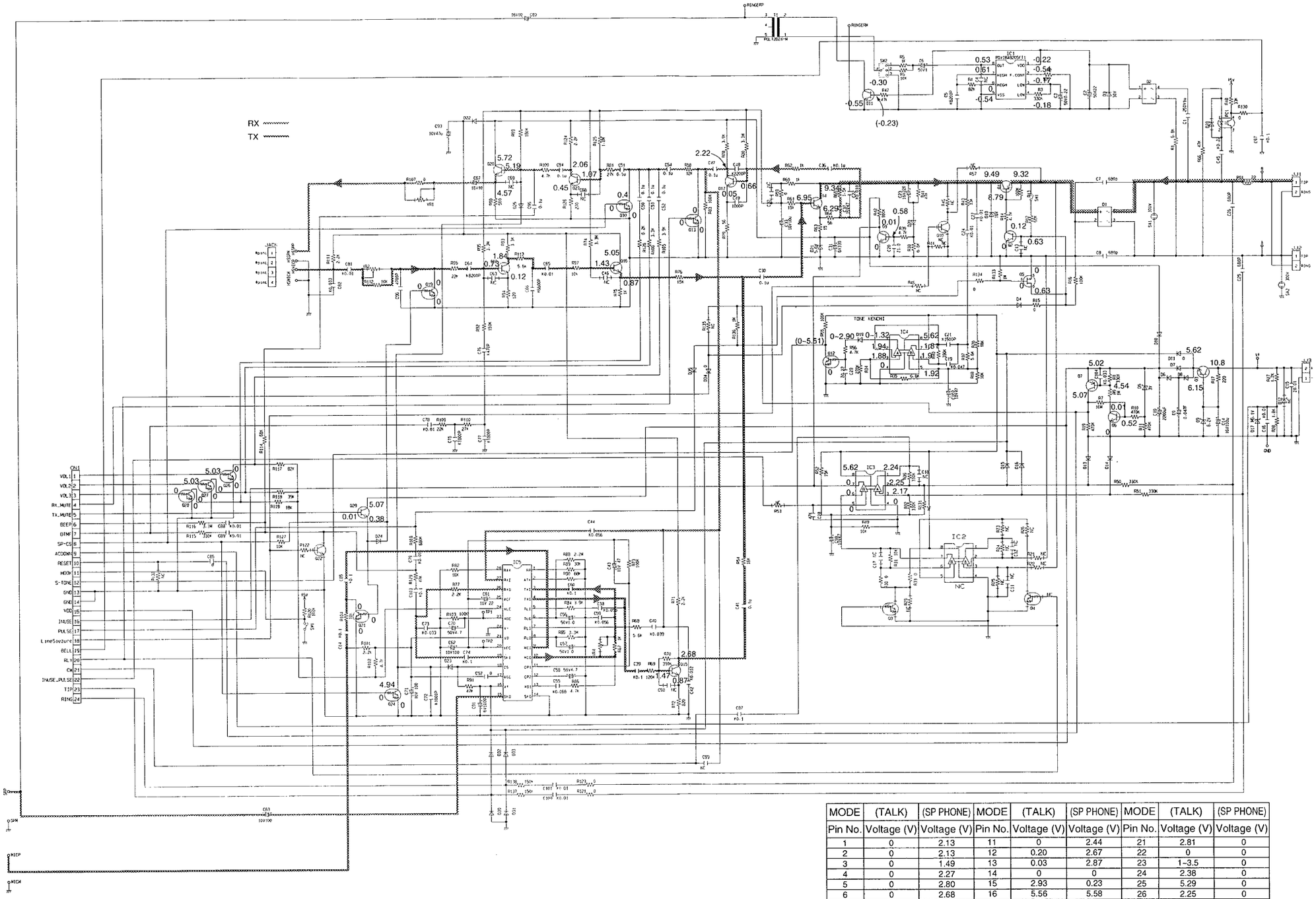
13.1. Component View



13.2. Flow Solder Side View



14 SCHEMATIC DIAGRAM (MAIN)

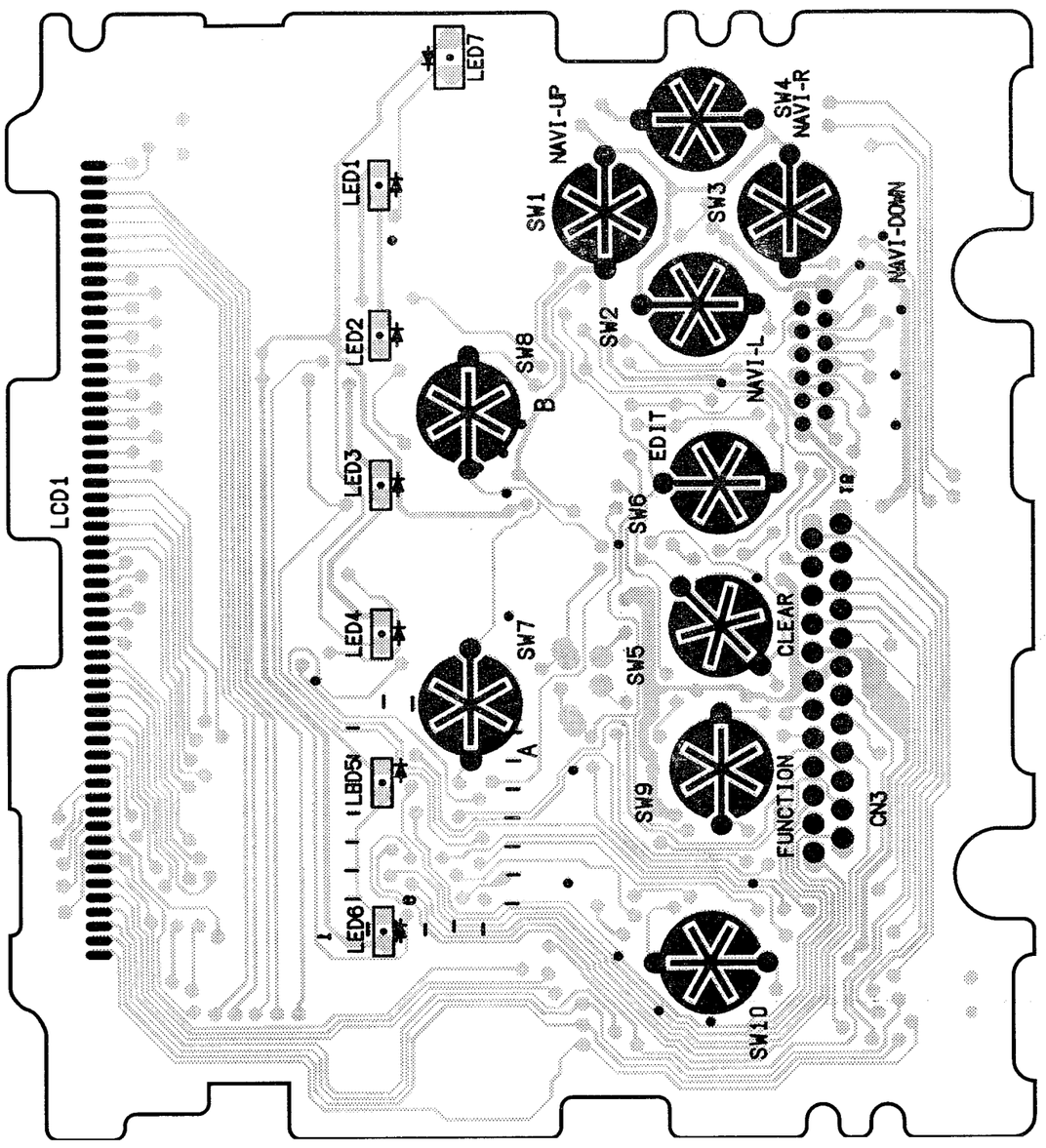


MODE	(TALK)	(SP PHONE)	MODE	(TALK)	(SP PHONE)	MODE	(TALK)	(SP PHONE)
Pin No.	Voltage (V)	Voltage (V)	Pin No.	Voltage (V)	Voltage (V)	Pin No.	Voltage (V)	Voltage (V)
1	0	2.13	11	0	2.44	21	2.81	0
2	0	2.13	12	0.20	2.67	22	0	0
3	0	1.49	13	0.03	2.87	23	1~3.5	0
4	0	2.27	14	0	0	24	2.38	0
5	0	2.80	15	2.93	0.23	25	5.29	0
6	0	2.68	16	5.56	5.58	26	2.25	0
7	0	2.80	17	2.81	0	27	1.49	0
8	0	2.75	18	0.52	4.08	28	2.09	0
9	0	2.80	19	0	0			
10	0	2.72	20	5.35	0			

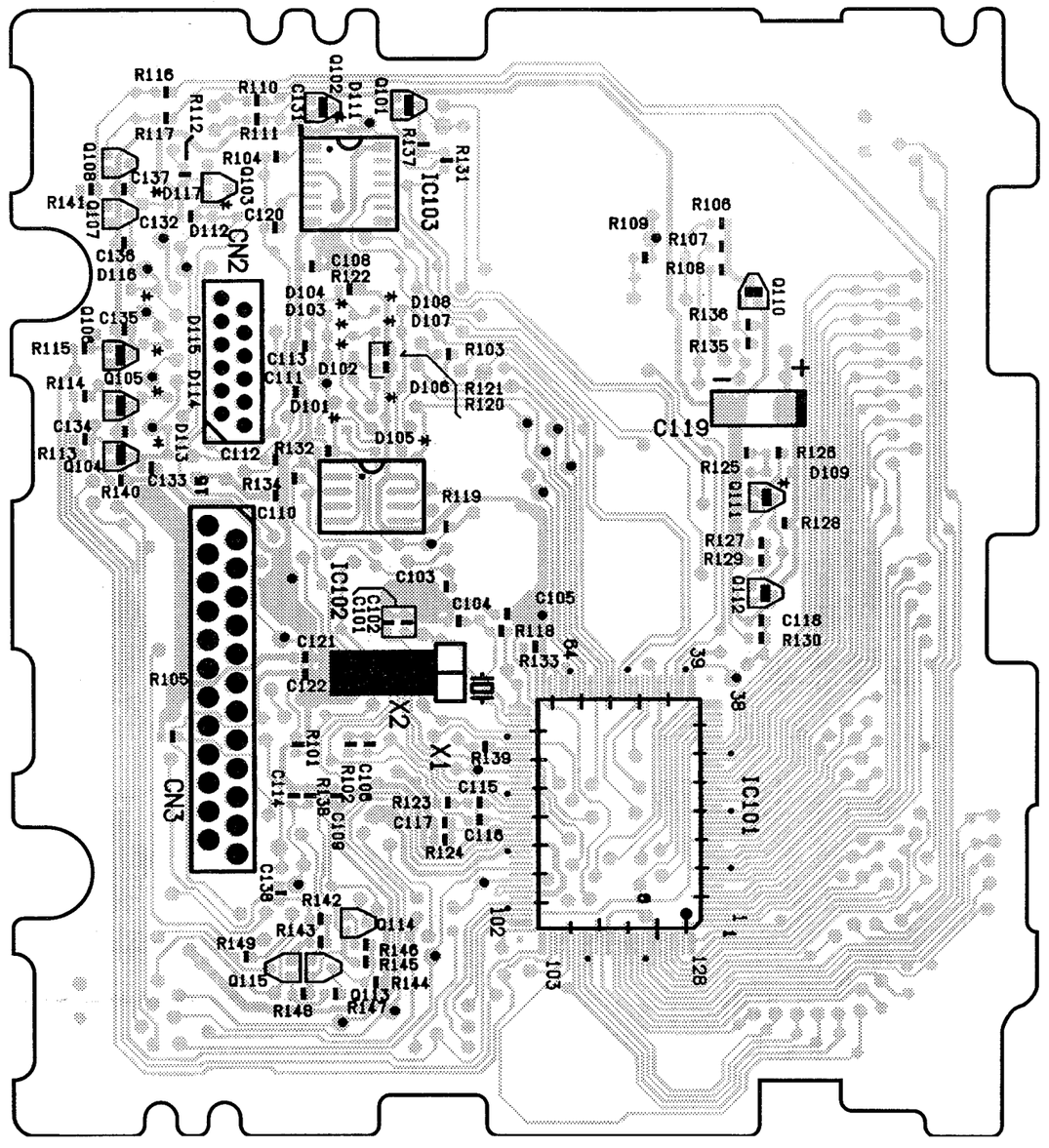
14.1. MEMO

15 PRINTED CIRCUIT BOARD (LCD)

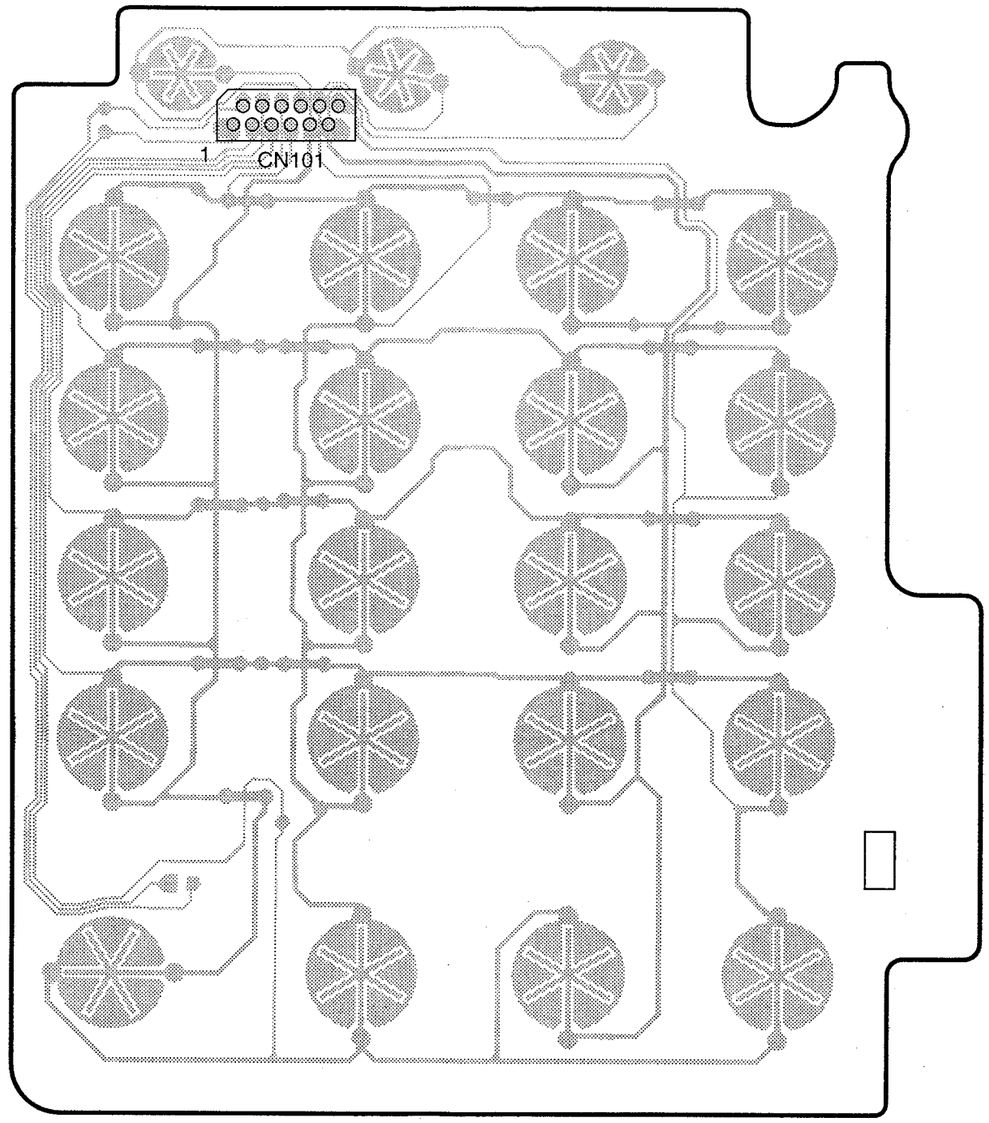
(Component View)



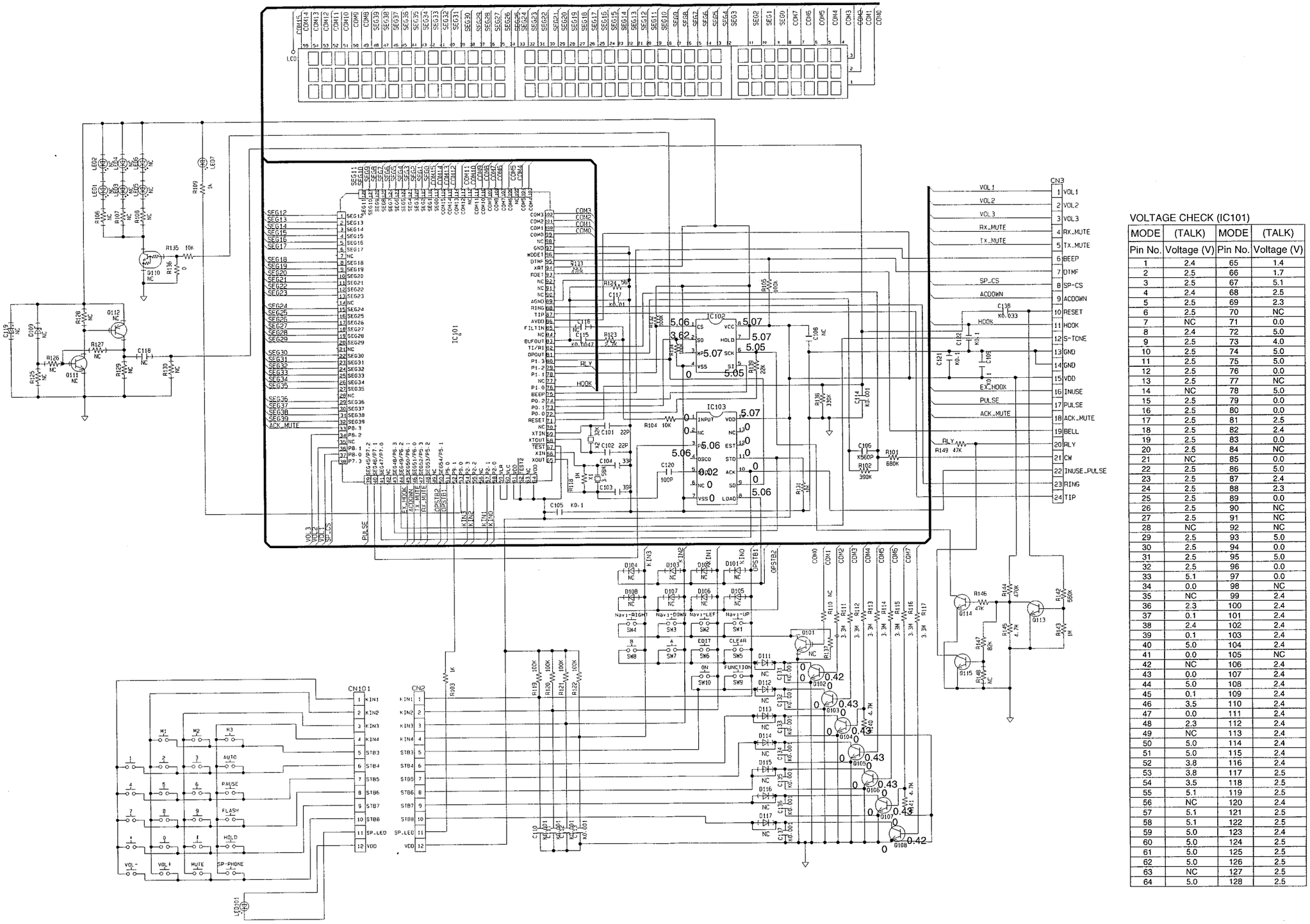
(Flow Solder Side View)



15.1. Printed Circuit Board (OPERATION)



16 SCHEMATIC DIAGRAM (OPERATION)

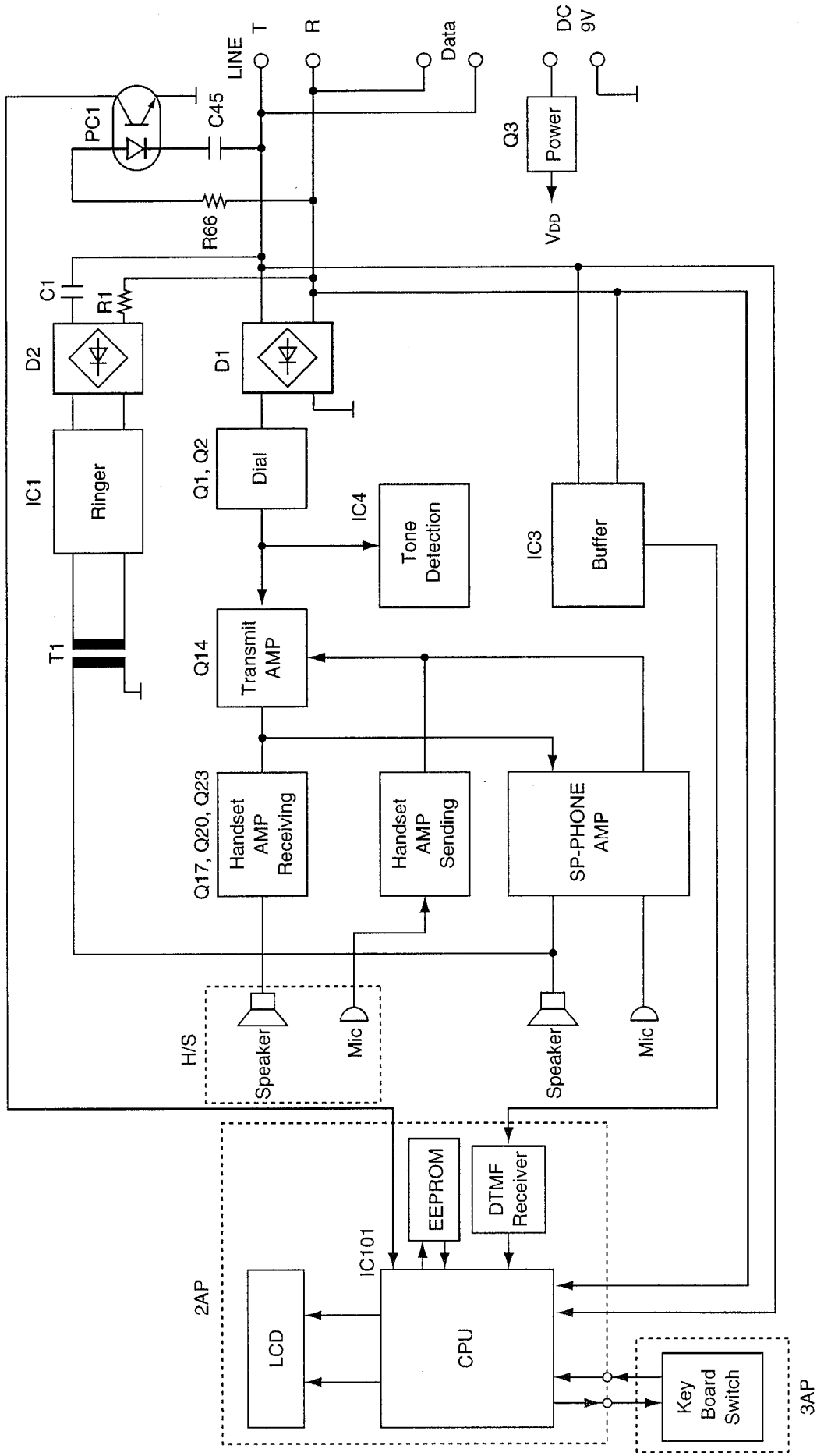


VOLTAGE CHECK (IC101)

MODE	(TALK)	MODE	(TALK)
Pin No.	Voltage (V)	Pin No.	Voltage (V)
1	2.4	65	1.4
2	2.5	66	1.7
3	2.5	67	5.1
4	2.4	68	2.5
5	2.5	69	2.3
6	2.5	70	NC
7	NC	71	0.0
8	2.4	72	5.0
9	2.5	73	4.0
10	2.5	74	5.0
11	2.5	75	5.0
12	2.5	76	0.0
13	2.5	77	NC
14	NC	78	5.0
15	2.5	79	0.0
16	2.5	80	0.0
17	2.5	81	2.5
18	2.5	82	2.4
19	2.5	83	0.0
20	2.5	84	NC
21	NC	85	0.0
22	2.5	86	5.0
23	2.5	87	2.4
24	2.5	88	2.3
25	2.5	89	0.0
26	2.5	90	NC
27	2.5	91	NC
28	NC	92	NC
29	2.5	93	5.0
30	2.5	94	0.0
31	2.5	95	5.0
32	2.5	96	0.0
33	5.1	97	0.0
34	0.0	98	NC
35	NC	99	2.4
36	2.3	100	2.4
37	0.1	101	2.4
38	2.4	102	2.4
39	0.1	103	2.4
40	5.0	104	2.4
41	0.0	105	NC
42	NC	106	2.4
43	0.0	107	2.4
44	5.0	108	2.4
45	0.1	109	2.4
46	3.5	110	2.4
47	0.0	111	2.4
48	2.3	112	2.4
49	NC	113	2.4
50	5.0	114	2.4
51	5.0	115	2.4
52	3.8	116	2.4
53	3.8	117	2.5
54	3.5	118	2.5
55	5.1	119	2.5
56	NC	120	2.4
57	5.1	121	2.5
58	5.1	122	2.5
59	5.0	123	2.4
60	5.0	124	2.5
61	5.0	125	2.5
62	5.0	126	2.5
63	NC	127	2.5
64	5.0	128	2.5

16.1. MEMO

17 BLOCK DIAGRAM



18 CIRCUIT OPERATIONS

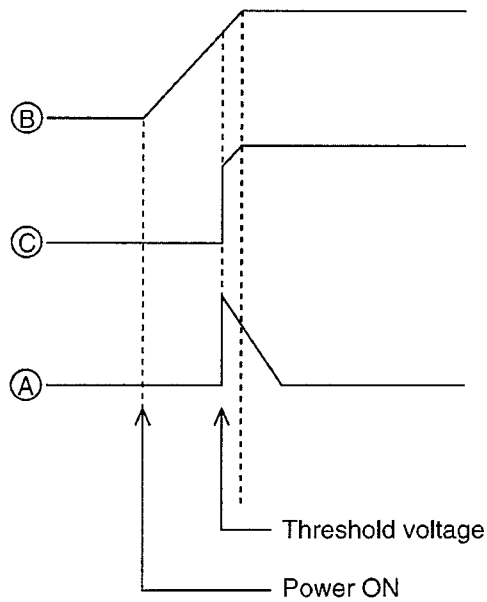
18.1. Reset Circuit

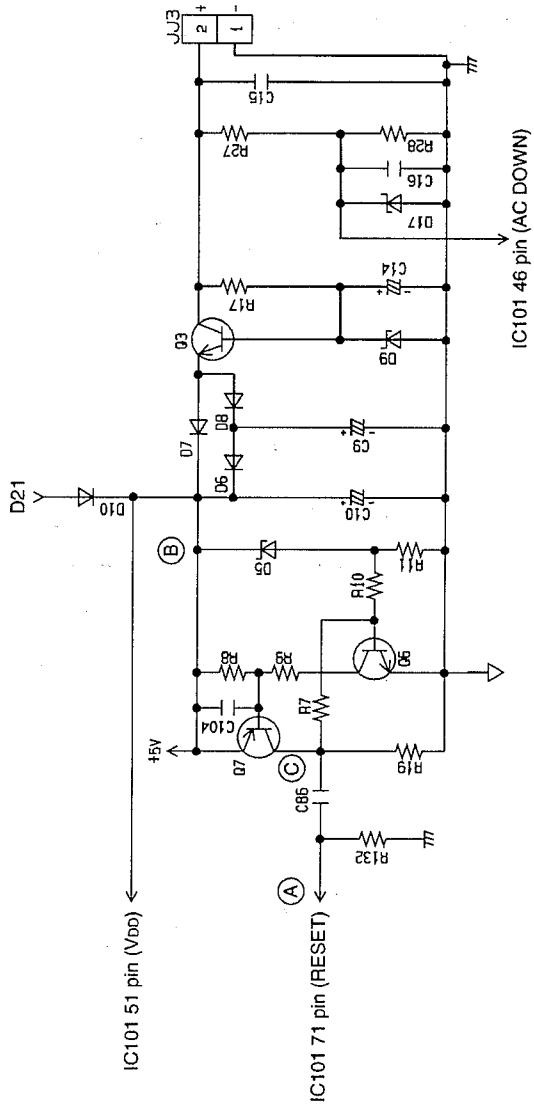
18.1.1. Function

The reset circuit is a detection circuit which is used to detect the power supply voltage and apply a reset to the microprocessor when the circuit changes from an ON-HOOK to an OFF-HOOK status.

18.1.2. Circuit operation

The reset conditions are as follows: When the AC adaptor is connected, the voltage appears at the point B as shown is Fig. At the threshold Vth, D5 is ON → Q6 is ON → Q7 is ON and the point C changes Low → High and the Point A changes as shown in Fig. 5.





18.2. Caller ID Detect Circuit

18.2.1. Function (FSK signal)

The caller ID is a changeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation of this circuit assumes that a caller ID service contract has been entered for the circuit being used. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.There are two types of the message format which can be received: i.e. the single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

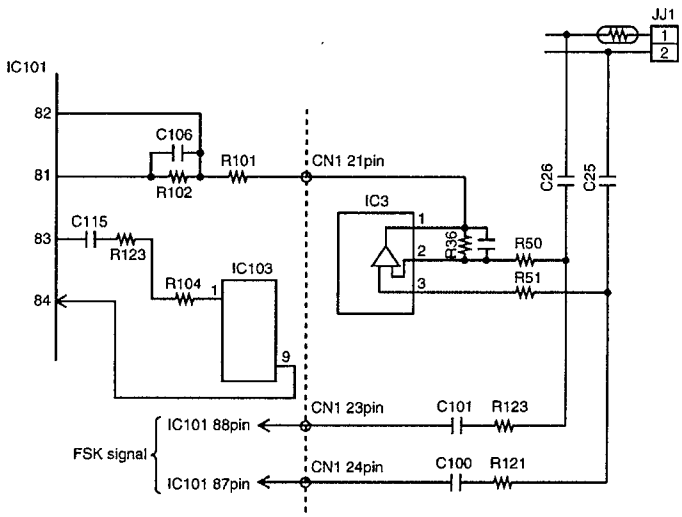
18.2.2. Circuit operation

Caller ID (FSK)

Caller ID signal is sent through the circuit via the following path: TEL Line → C25, C26 → R121, R123 → C100,C101 → CN1 23Pin, 24Pin, 87Pin and 88Pin of IC101

Caller ID (DTMF)

TEL Line → C25, C26 → R50, R51 → Pin1 of IC4 → CN1 21Pin → R101 → R102 → 81Pin of IC101 → 83Pin of IC101 → 1Pin of IC103 → 9Pin of IC103 → 80Pin of IC101



18.3. SPEAKERPHONE CIRCUIT

Function:

This circuit controls the automatic switching of the transmitted and received signals, to and from the telephone line, when the unit is used in the hands-free mode.

Circuit Operation:

The Speakerphone can only provide a one-way communication path. In order words, it can either transmit an outgoing signal or receive an incoming signal at a given time, but cannot do both simultaneously. Therefore, a switching circuit is necessary to control the flow of the outgoing and incoming signals. This switching circuit is contained in IC5 and consists of a Voice Detector, Tx Attenuator, Rx Attenuator, Comparator and Attenuator Control. The circuit analyzes whether the Tx (transmit) or the Rx (receive) signal is louder, and then it processes the signals such that the louder signal is given precedence.The Voice Detector provides a DC input to the Attenuator Control corresponding to the Tx signal.The Comparator receives a Tx and Rx signal, and supplies a DC input to the Attenuator Control corresponding to the Rx signal. The Attenuator Control provides a control signal to the Tx and Rx Attenuator to switch the appropriate signals on and off. The Attenuator Control also detects the level of the volume control to automatically adjust for changing ambient conditions.

1) Transmission Signal Path

The input signal from the microphone is sent through the circuit via the following path:

- Mic→Pin 9 of IC5→Pin 10 of IC5→Pin 3 of IC5→Pin 4 of IC5→Amp (Q15)→Interface (Q14) →Telephone Line.

2) Reception Signal Path

Signals receive from the telephone line are outputted at the speaker via the following path:

- Telephone Line->Interface (Q14)→receive amp (Q17)→Pin 27 of IC5→Pin 26 of IC5→Pin 19 of IC5→Pin 15 of IC5→Speaker.

3) Control Signal Path

Control signals for transmission and reception are inputted to IC2 via the following path:(Transmission Control Signal Path)

- Mic→Pin 9 of IC5→Pin 10 of IC5→Pin 3 of IC5→Pin 4 of IC5→Pin 5 of IC5(Reception Control Signal Path)
- Telephone Line→Interface (Q14)→Receive amp (Q17)→Pin 7 of IC5

4) Transmission/Reception Switching

The comparison result between Tx and Rx outputs as a DC level of IC5 pin25.
Tx level is high.....Pin 25=Pin20—6mV
Rx level is high.....Pin 25=Pin20—150mV
Comparator output is connected to the attenuator control inside of IC5.

5) Voice Detector

The output of the mic amp (Pin 10 of IC5) is supplied to Pin 13 of IC5 as a control signal for the voice detector.

6) Attenuator Control

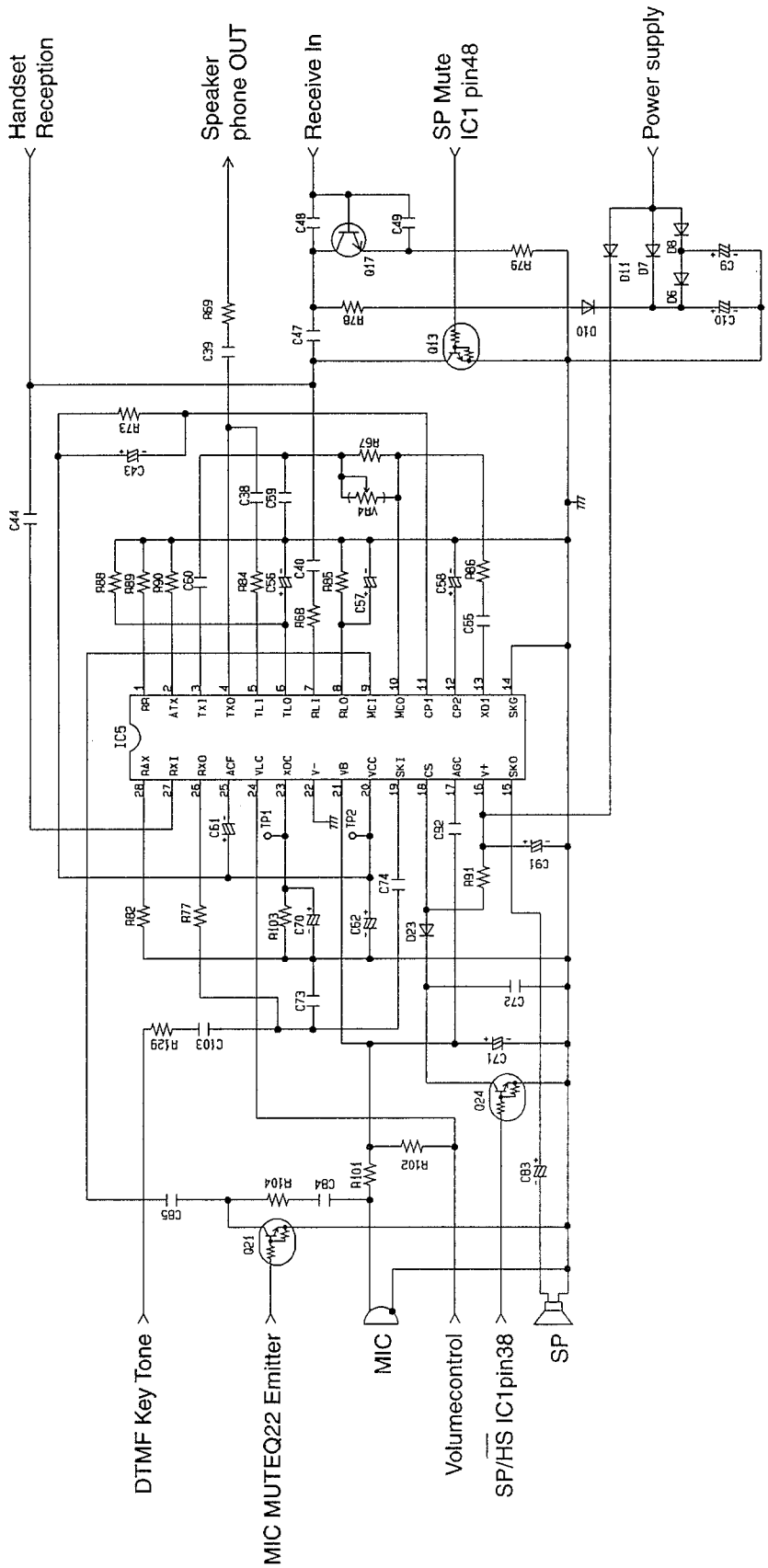
The attenuator control detects the setting of the volume control through Pin 24 of IC5 automatically adjust for changing ambient conditions.

18.4. SP-Phone RX

Telephone Line → C22 → C36 → R62 → Q17 → C47 → C44 → IC9 27Pin → IC9 26Pin → IC9 19Pin → IC9 15Pin → C83→ Speaker

18.5. SP-Phone TX

MIC → C84 → R104 → C85 → IC9 9Pin → IC9 10Pin → R67→ C60 → IC9 3Pin → IC9 4Pin → C39 → R69 → Q15 Base → Q92 Collector → C41 → R54 → C30 → Q14 Base → Q14 Collector → Q1 → Telephone Line



18.6. Tone Detect

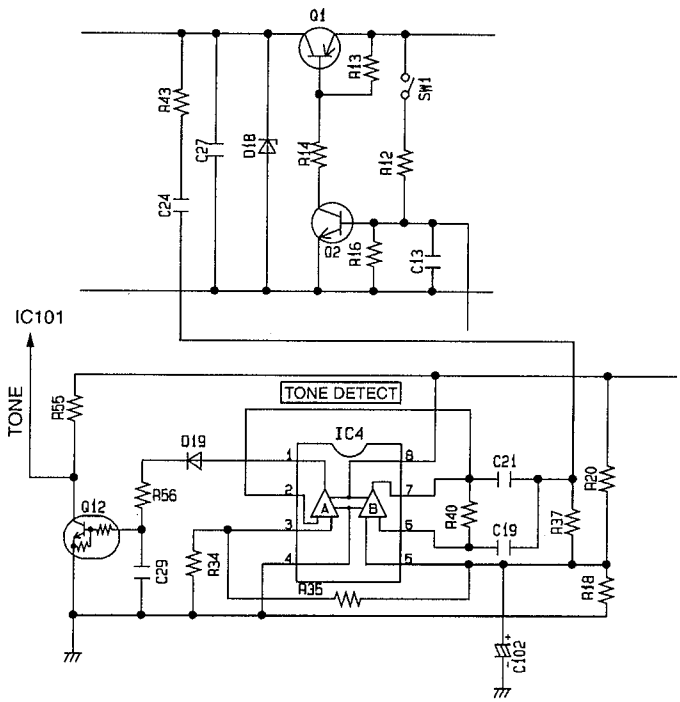
This circuit is used to sense the status of the line (busy tone or dial tone) during Auto Redial.

18.6.1. Circuit operation

D1 → Q1 Emitter → Q1 Collector → R43 → C24 → R37 → IC4 5Pin → IC4 1Pin → D19→ R56→ Q12 Base

When the subscriber hangs-up, check the intermittent tone.

If cycle tone is detected, the collector of Q12 Collector goes to a low level.

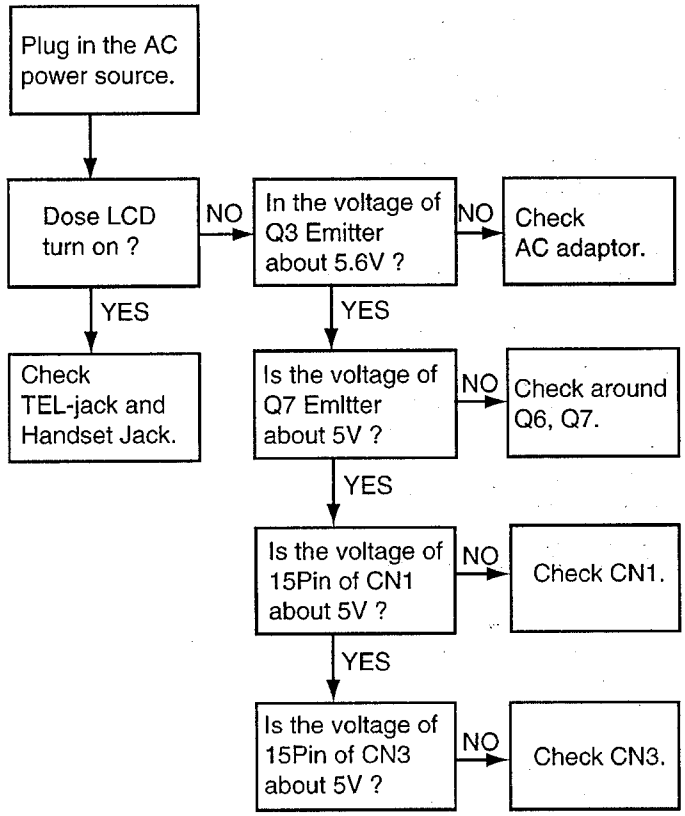


19 TROUBLESHOOTING GUIDE

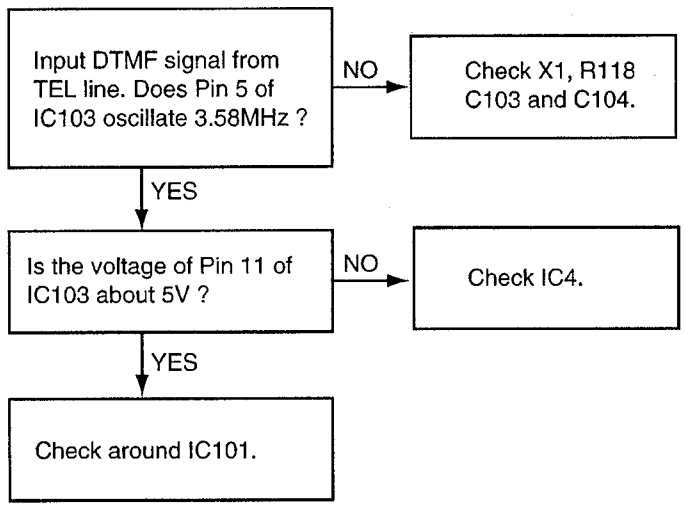
19.1. Service Hints

SYMPTOM	CURE
Can't dial.	Check IC101, X1, X2.
Can't hear the voice from handset.	Check Q17, Q23, Q20.
No voice transmit.	Check Q14 and Q18, Q16.
Can't tone dial.	Check IC101 and C78, R109, C76, R92.
Can't pulse dial.	Check Q1 and Q2, Q5.
Can't auto dial.	Check IC4, Q12.
No rings.	Check IC1, T1.
Can't speak with the speakerphone.	Check IC5.
Can't hold.	Check
Can't speak with the handset.	Check Handset jack.
Can't change the volume speakerphone.	Check IC101, IC5, Q26, Q27, Q28.
Can't change the volume for Handset.	Check IC101, Q26, Q27, Q28.
No volume handset or speakerphone.	Check IC101, Q14.

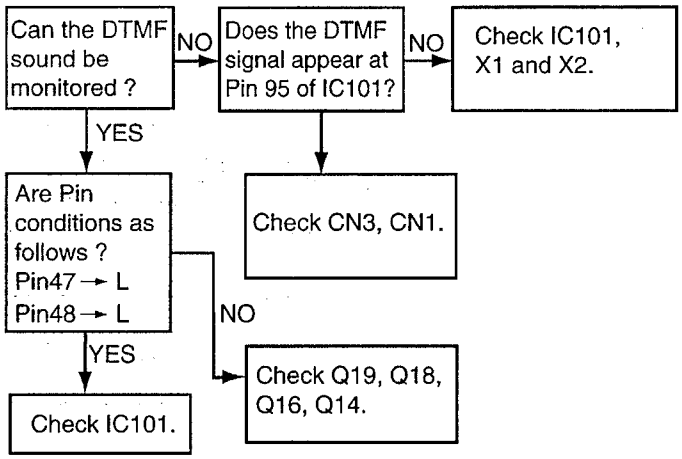
19.2. Functions Do Not Work



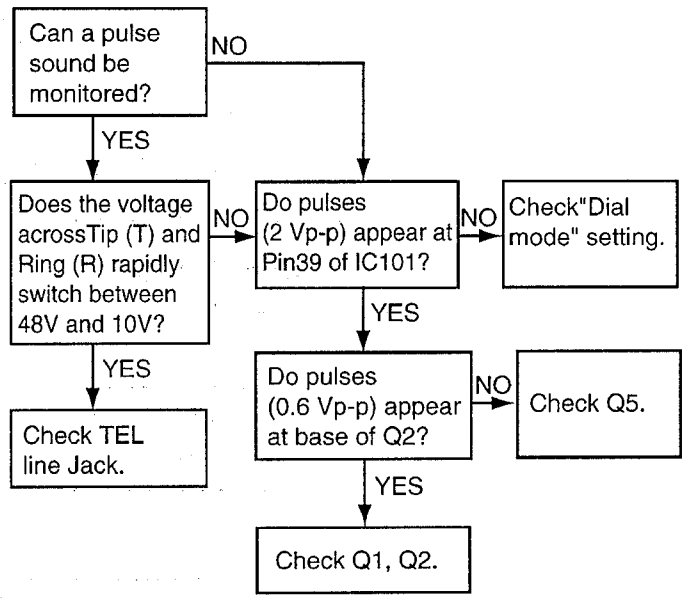
19.3. Caller ID Function Does Not Work (DTMF Signal)


Input DTMF signal from TEL line. Does Pin 5 of IC103 oscillate 3.58MHz ?
NO
Check X1, R118 C103 and C104.
YES
Is the voltage of Pin 11 of IC103 about 5V ?
NO
Check IC4.
YES
Check around IC101.

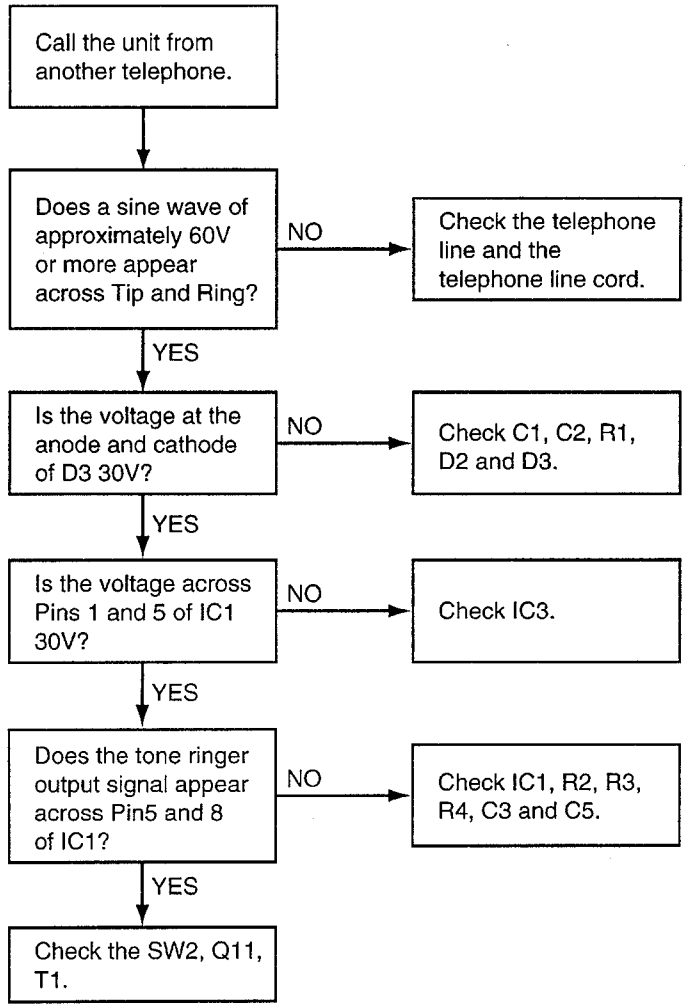
19.4. Tone Dialing Problems (Handset)



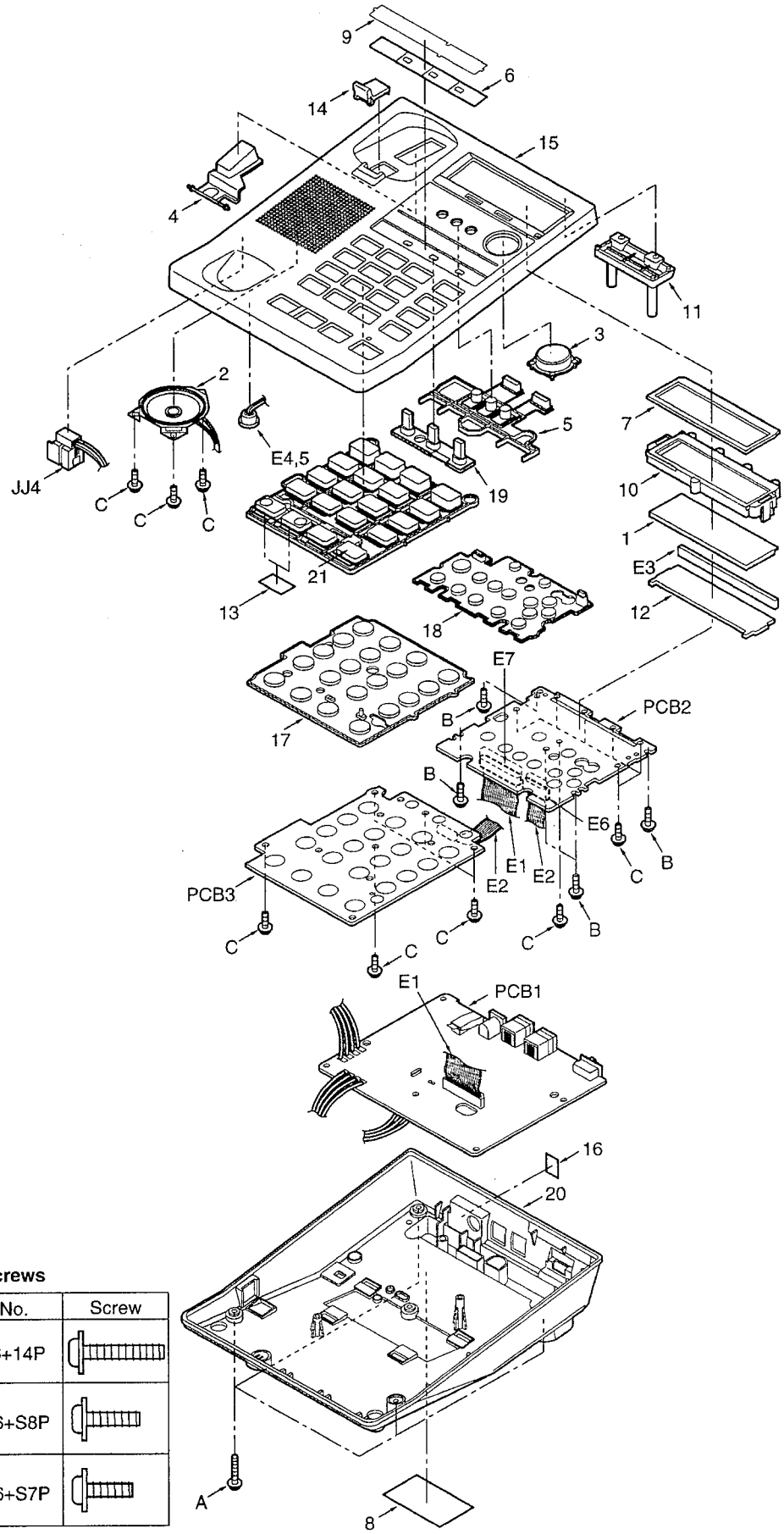
19.5. Pulse Dialing Problems



19.6. No "RINGING" Sound When a Ring Signal is Input


Call the unit from another telephone.
Does a sine wave of approximately 60V or more appear across Tip and Ring?
NO
Check the telephone line and the telephone line cord.
YES
Is the voltage at the anode and cathode of D3 30V?
NO
Check C1, C2, R1, D2 and D3.
YES
Is the voltage across Pins 1 and 5 of IC1 30V?
NO
Check IC3.
YES
Does the tone ringer output signal appear across Pin5 and 8 of IC1?
NO
Check IC1, R2, R3, R4, C3 and C5.
YES
Check the SW2, Q11, T1.

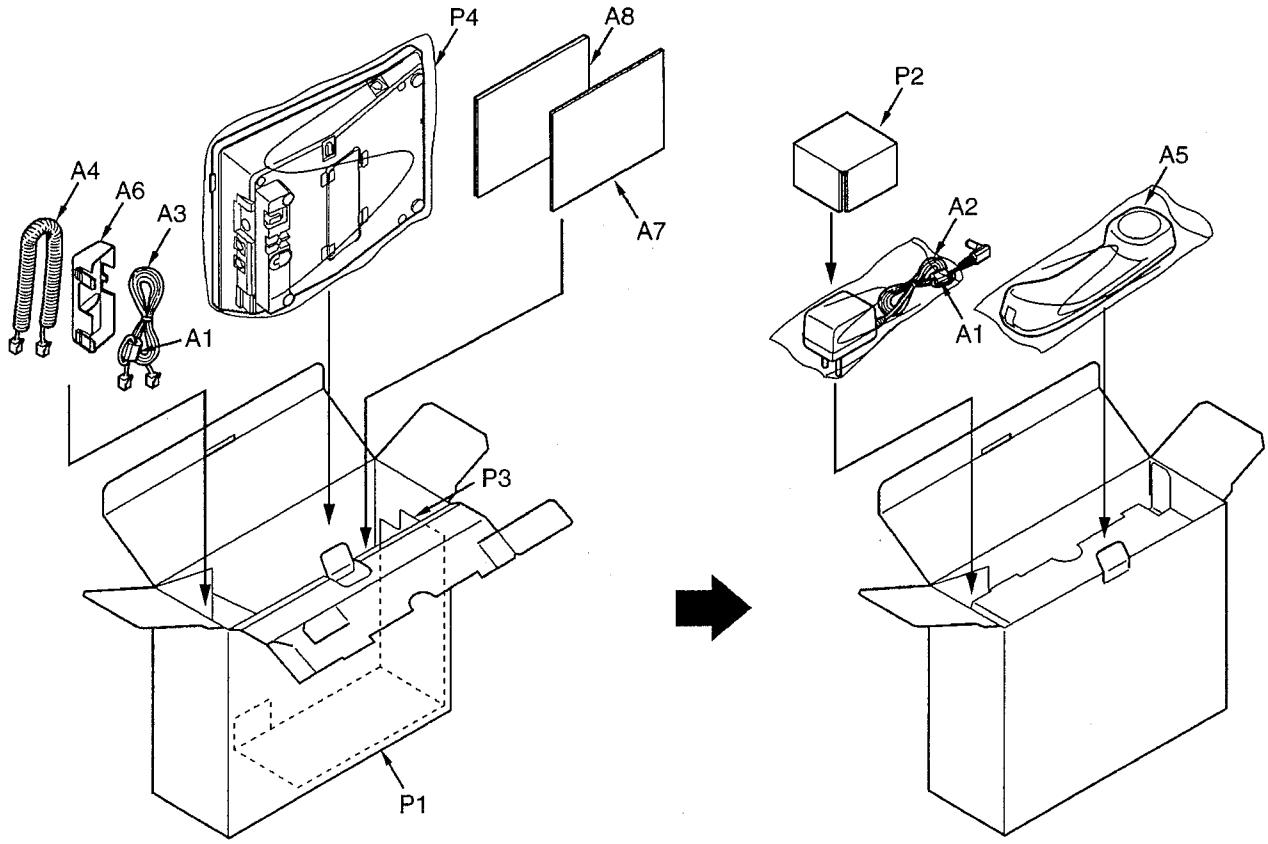
20 CABINET AND ELECTRICAL PARTS



Actual Size of Screws

Ref. No.	Part No.	Screw
A	XTW26+14P	
B	XTW26+S8P	
C	XTW26+S7P	

21 ACCESSORIES AND PACKING MATERIALS



22 REPLACEMENT PARTS LIST

This replacement parts list is KX-TSC30BX-W only.

1. RTL (Retention Time Limited)

Note:

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability depends on the type of assembly and the laws govering parts and product retention. At the end of this period, the assembly will no longer be available.

2. Important safety notice

Components identified by the mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified;

All resistors are in ohms (Ω) K=1000Ω, M=1000kΩ

All capacitors are in MICRO FARADS (μF)P=μμF

*Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyester
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

22.1. KX-TSC30BX-W

CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQADGS9087Z	LIQUID CRYSTAL DISPLAY	
2	PQAS57P03Z	SPEAKER	
3	PQBC10295Z1	NAVIGATOR KEY	S
4	PQBH10027Z1	BUTTON, HOOK	S
5	PQBX10328Y1	BUTTON, FUNCTION etc...	S
6	PQGD10159Z	TEL CARD	
7	PQGP10157Z1	LCD PANEL	S
8	PQGT13989Z	NAME PLATE	
9	PQGV10036Z	TEL CARD COVER	
10	PQHR10724Z	LCD HOLDER	
11	PQHR10725Z	PCB SPACER	
12	PQHR10733Z	LCD SPACER	
13	PQHX10312Z	PVC SHEET	
14	PQKE10070Z3	HANGER	S
15	PQKM10418T1	UPPER CABINET	S
16	PQQT22091Z	ADAPTOR LABEL	
17	PQSX10088Y	RUBBER SWITCH, 20KEY	
18	PQSX10122Z	RUBBER SWITCH, 15KEY	
19	PQSX10123Z	RUBBER SWITCH, 3KEY	
20	PQYF10164Z1	LOWER CABINET	S
21	PQYT10012Y1	BUTTON, SP-PHONE	S

ACCESSORIES

Ref. No.	Part No.	Part Name & Description	Remarks
A1	KRCBG130714	COVER	
A2	KX-TCA1BX	AC ADAPTOR	⚠
A3	PQJA10075Z	TEL CORD	
A4	PQJA212M	CURL CORD	
A5	PQJXF0102Z	HANDSET	
A6	PQKL24Y81	STAND	S
A7	PQQW12198Z	LEAFLET (FOR ARABIAN)	
A8	PQQX12633Z	INSTRUCTION BOOK	

PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
P1	PQPK13000Z	GIFT BOX	
P2	PQPD10440Y	PAD	
P3	PQPD10465Z	PAD	
P4	PQPH89Y	PROTECTION COVER (FOR UNIT)	

MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1SC30BXH	MAIN PC BOARD ASSEMBLY (RTL)	
		(ICS)	
IC1	PQVIBA8205F	IC	
IC3	PQVINJM2904F	IC	S
IC4	PQVINJM2904F	IC	S
IC5	PQVISC77655S	IC	
		(TRANSISTORS)	
Q1	2SA1625	TRANSISTOR(SI)	
Q2	PQVT2N6517CA	TRANSISTOR(SI)	
Q3	2SD2136	TRANSISTOR(SI)	
Q5	2SK1398	TRANSISTOR(SI)	
Q6	2SD1819A	TRANSISTOR(SI)	
Q7	2SB1218A	TRANSISTOR(SI)	
Q9	2SD1819A	TRANSISTOR(SI)	
Q11	2SD1819A	TRANSISTOR(SI)	
Q12	UN5213	TRANSISTOR(SI)	S
Q13	PQVTFB1J3P	TRANSISTOR(SI)	
Q14	2SC2120	TRANSISTOR(SI)	
Q15	2SD1819A	TRANSISTOR(SI)	
Q16	2SD1819A	TRANSISTOR(SI)	
Q17	2SD1819A	TRANSISTOR(SI)	
Q18	2SD1819A	TRANSISTOR(SI)	
Q19	PQVTFB1J3P	TRANSISTOR(SI)	
Q20	2SD1819A	TRANSISTOR(SI)	
Q21	PQVTD143Z106	TRANSISTOR(SI)	S
Q23	2SD1819A	TRANSISTOR(SI)	
Q24	UN5213	TRANSISTOR(SI)	S
Q26	UN5213	TRANSISTOR(SI)	S
Q27	UN5213	TRANSISTOR(SI)	S
Q28	UN5213	TRANSISTOR(SI)	S
Q29	2SD1819A	TRANSISTOR(SI)	
Q30	PQVTD143Z106	TRANSISTOR(SI)	S

KX-TSC30BX-W

Ref. No.	Part No.	Part Name & Description	Remarks
		(DIODES)	
D1	PQVDS1ZB60F1	DIODE(SI)	
D2	PQVDS1ZB60F1	DIODE(SI)	
D3	MA4300	DIODE(SI)	
D4	MA111	DIODE(SI)	
D5	PQVDHZS3ALL	DIODE(SI)	
D6	MA723	DIODE(SI)	
D7	1SS119	DIODE(SI)	
D8	1SS119	DIODE(SI)	
D9	MA4062	DIODE(SI)	
D10	1SS119	DIODE(SI)	
D13	1SS119	DIODE(SI)	
D14	1SS119	DIODE(SI)	
D15	1SS119	DIODE(SI)	
D16	1SS119	DIODE(SI)	
D17	MA4051	DIODE(SI)	
D18	MA4180	DIODE(SI)	
D19	1SS119	DIODE(SI)	
D20	1SS119	DIODE(SI)	
D21	MA4056	DIODE(SI)	
D22	1SS119	DIODE(SI)	
D23	1SS119	DIODE(SI)	
D24	1SS119	DIODE(SI)	
D25	1SS119	DIODE(SI)	
D30	1SS119	DIODE(SI)	
D31	1SS119	DIODE(SI)	
D32	1SS119	DIODE(SI)	
D33	1SS119	DIODE(SI)	
D35	1SS119	DIODE(SI)	
		(JACKS)	
JJ1	PQJJ1T008X	JACK	
JJ2	PQJJ1T008X	JACK	
JJ3	PQJJ1B4Y	JACK	
JJ4	PQJJ1TB2Y	JACK	
		(CONNECTOR)	
CN1	PQJS24X54Z	CONNECTOR	
		(VARISTORS)	
SA1	PQVDDSS301L	VARISTOR	
SA2	PQVDDSS301L	VARISTOR	
		(OTHERS)	
E1	PQJE10091Z	FLEXIBLE FLAT CABLE	
E2	PQJE10098Z	FLEXIBLE FLAT CABLE	
E3	PQJE10099Z	ZEBRA CONNECTOR	
E4	PQJM122Z	MICROPHONE	
E5	PQMG10022Z	MIC, RUBBER	
E6	KR16FP220610	FELIGHT CORE	
E7	KR16FP400710	FELIGHT CORE	
PC1	ON3181	PHOTO ELECTRIC TRANSDUCER	
PO1	PQRPAR390N	POSISTOR	S
SW1	ESE14A211	SWITCH	
SW2	PQSS3A17W	SWITCH	
T1	PQLT2D2A	TRANSFORMER	
		(RESISTORS)	
R1	ERDS2TJ682	6.8k	
R2	ERJ3GEYJ183	18k	
R3	ERJ3GEYJ334	330k	
R4	ERJ3GEYJ823	82k	
R5	ERJ3GEYJ102	1k	
R6	ERJ3GEYJ103	10k	
R7	ERJ3GEYJ106	10M	

Ref. No.	Part No.	Part Name & Description	Remarks
R8	ERJ3GEYJ334	330k	
R9	ERJ3GEYJ105	1M	
R10	ERJ3GEYJ474	470k	
R11	ERJ3GEYJ474	470k	
R12	ERJ3GEYJ683	68k	
R13	ERDS2TJ104	100k	
R14	PQ4R10XJ472	4.7k	S
R15	ERJ3GEY0R00	0	
R16	ERJ3GEYJ104	100k	
R17	ERDS2TJ221	220	
R18	ERJ3GEYJ103	10k	
R19	ERJ3GEYJ474	470k	
R20	ERJ3GEYJ183	18k	
R27	PQ4R10XJ152	1.5k	S
R28	PQ4R10XJ182	1.8k	S
R30	ERJ3GEY0R00	0	
R31	ERJ3GEYJ103	10k	
R32	ERDS2TJ334	330k	
R33	ERJ3GEY0R00	0	
R34	ERJ3GEYJ274	270k	
R35	ERJ3GEYJ682	6.8k	
R36	ERDS2TJ334	330k	
R37	ERJ3GEYJ562	5.6k	
R38	ERJ3GEYJ682	6.8k	
R39	ERJ3GEYJ472	4.7k	
R40	ERJ3GEYJ394	390k	
R41	ERJ3GEYJ473	47k	
R42	ERJ3GEYJ104	100k	
R43	ERJ3GEYJ333	33k	
R47	ERJ3GEYJ473	47k	
R48	ERJ3GEYJ333	33k	
R49	ERJ3GEYJ103	10k	
R50	ERDS2TJ334	330k	
R51	ERDS2TJ334	330k	
R52	ERJ3GEYJ153	15k	
R54	ERDS2TJ183	18k	
R55	ERJ3GEYJ104	100k	
R56	ERJ3GEYJ472	4.7k	
R58	ERJ3GEYJ123	12k	
R59	ERJ3GEY0R00	0	
R60	ERJ3GEYJ102	1k	
R61	ERJ3GEYJ153	15k	
R62	ERJ3GEYJ102	1k	
R63	ERDS2TJ150	15	
R64	ERJ3GEYJ560	56	
R65	ERJ3GEYJ152	1.5k	
R66	ERDS2TJ473	47k	
R67	ERJ3GEYJ102	1k	
R68	ERJ3GEYJ562	5.6k	
R69	ERJ3GEYJ124	120k	
R70	ERJ3GEYJ394	390k	
R71	ERDS2TJ222	2.2k	
R72	ERJ3GEYJ821	820	
R73	ERJ3GEYJ104	100k	
R74	ERJ3GEYJ335	3.3M	
R75	ERJ3GEYJ102	1k	
R76	ERDS2TJ153	15k	
R77	ERJ3GEYJ222	2.2k	
R78	ERJ3GEYJ392	3.9k	
R79	ERJ3GEYJ560	56	
R80	ERJ3GEYJ335	3.3M	
R81	ERDS2TJ273	27k	
R82	ERJ3GEYJ183	18k	
R83	ERJ3GEYJ104	100k	
R84	ERJ3GEYJ392	3.9k	

Ref. No.	Part No.	Part Name & Description	Remarks
R85	ERJ3GEYJ335	3.3M	
R86	ERJ3GEYJ472	4.7k	
R88	ERJ3GEYJ225	2.2M	
R89	ERJ3GEYJ303	30k	
R90	ERJ3GEYJ683	68k	
R91	ERDS2TJ473	47k	
R92	ERJ3GEYJ154	150k	
R93	ERJ3GEYJ332	3.3k	
R94	ERJ3GEYJ121	120	
R95	ERJ3GEYJ335	3.3M	
R96	ERJ3GEYJ223	22k	
R97	ERJ3GEYJ103	10k	
R98	ERJ3GEYJ561	560	
R99	ERJ3GEYJ184	180k	
R100	ERJ3GEYJ472	4.7k	
R101	ERJ3GEYJ222	2.2k	
R102	ERJ3GEYJ472	4.7k	
R103	ERJ3GEYJ104	100k	
R104	ERJ3GEYJ103	10k	
R105	ERJ3GEYJ392	3.9k	
R106	ERJ3GEYJ332	3.3k	
R107	ERJ3GEY0R00	0	
R108	ERJ3GEYJ684	680k	
R109	ERJ3GEYJ223	22k	
R110	ERJ3GEYJ273	27k	
R111	ERJ3GEYJ222	2.2k	
R112	ERJ3GEYJ103	10k	
R113	ERJ3GEYJ562	5.6k	
R114	ERJ3GEYJ683	68k	
R115	ERJ3GEYJ334	330k	
R116	ERJ3GEYJ335	3.3M	
R117	ERJ3GEYJ823	82k	
R118	ERJ3GEYJ393	39k	
R119	ERJ3GEYJ183	18k	
R120	ERJ3GEYJ104	100k	
R124	ERJ3GEYJ222	2.2k	
R125	ERJ3GEYJ185	1.8M	
R126	ERJ3GEYJ271	270	
R127	ERDS2TJ103	10k	
R128	ERJ3GEYJ822	8.2k	
R129	ERDS2TJ473	47k	
R130	ERJ3GEY0R00	0	
R133	ERJ3GEYJ105	1M	
R134	ERJ3GEY0R00	0	
R136	ERJ3GEYJ105	1M	
R137	ERDS1TJ154	150k	
R138	ERDS1TJ154	150k	
C28	ERJ3GEYJ473	47K	
C86	ERJ3GEY0R00	0	
C92	PQ4R10XJ0R00	0	
J101	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	ECQE2E105KZ	1	S
C2	ECEA1HKS220	22	S
C3	ECEA1HKSR22	0.22	S
C5	ECUV1H822KBV	0.0082	
C6	ECEA1HKA010	1	
C7	ECKD2H681KB	680P	S
C8	ECKD2H681KB	680P	S
C9	EECFM5R5473	0.047F	
C10	ECA0JM222	0.0022	

Ref. No.	Part No.	Part Name & Description	Remarks
C14	ECEA1CK101	100	S
C15	PQCUV1H103ZF	0.01	
C16	ECUV1H103KBV	0.01	
C19	ECUV1C473KBV	0.047	
C20	ECUV1A105ZFV	1	
C21	ECUV1H152KBV	0.0015	
C22	ECUV1H183KBV	0.018	
C23	ECEA1CKA221	220	
C24	ECUV1H103KBV	0.01	
C25	ECKD2H681KB	680P	S
C26	ECKD2H681KB	680P	S
C27	ECUV1H103KBV	0.01	
C29	ECUV1C224ZFV	0.22	
C30	ECUV1C104KBV	0.1	
C31	ECEA0JKA331	330	
C33	ECEA1CKS100	10	S
C36	ECUV1C104KBV	0.1	
C37	ECEA1EK470	47	S
C38	ECUV1C563KBV	0.056	
C39	ECUV1C104KBV	0.1	
C40	ECUV1C393KBV	0.039	
C41	ECUV1C104KBV	0.1	
C42	ECUV1H123KBV	0.012	
C43	ECEA1EK470	47	S
C44	ECUV1C563KBV	0.056	
C45	ECQE2E224JZ	0.22	S
C47	ECUV1C104KBV	0.1	
C48	ECUV1H222KBV	0.0022	
C49	ECUV1H102KBV	0.001	
C50	ECUV1C104KBV	0.1	
C51	ECUV1C104KBV	0.1	
C52	ECUV1C104KBV	0.1	
C53	ECUV1C104KBV	0.1	
C54	ECUV1C104KBV	0.1	
C55	ECUV1C683KBV	0.068	
C56	ECEA1HKA010	1	
C57	ECEA1HKA010	1	
C58	ECEA1HKS4R7	4.7	S
C59	ECUV1C563KBV	0.056	
C60	ECUV1C104KBV	0.1	
C61	ECEA1CKS220	22	S
C62	ECEA1CK101	100	S
C64	ECUV1H822KBV	0.0082	
C65	ECUV1H103KBV	0.01	
C66	ECUV1H682KBV	0.0068	
C67	ECEA1CKS100	10	S
C70	ECEA1HKS4R7	4.7	S
C71	ECEA1CK101	100	S
C72	ECUV1H102KBV	0.001	
C73	ECUV1H333KDV	0.033	S
C74	ECUV1C104KBV	0.1	
C75	ECUV1H182KBV	0.0018	
C76	ECUV1H471JCV	470P	S
C77	ECUV1H102KBV	0.001	
C78	ECUV1H103KBV	0.01	
C79	ECUV1H103KBV	0.01	
C80	ECEA1CKS100	10	S
C81	ECUV1H103KBV	0.01	
C82	ECUV1H333KDV	0.033	S
C83	ECEA1CK101	100	S
C84	ECUV1C104KBV	0.1	
C85	ECUV1C104KBV	0.1	
C87	ECUV1C104KBV	0.1	
C88	ECUV1H103KBV	0.01	
C89	ECUV1H103KBV	0.01	

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Ref. No.	Part No.	Part Name & Description	Remarks
C91	ECEA0JWA102	1000	
C93	ECEA1EK470	47	S
C94	ECUV1C104KBV	0.1	
C95	ECUV1C104KBV	0.1	
C96	ECUV1H472KBV	0.0047	
C97	ECUV1C104KBV	0.1	
C98	ECEA1EK470	47	S
C100	ECUV1H103KBV	0.01	
C101	ECUV1H103KBV	0.01	
C102	ECEA1EK470	47	S
C103	ECUV1C104KBV	0.1	
C104	ECUV1H333KDV	0.033	S

LCD P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQWP2SC30BXH	LCD PC BOARD ASSEMBLY (RTL)	
		(ICS)	
IC101	PQVI93423012	IC	
IC102	PQVINM2C16LM	IC	S
IC103	PQVILC73872M	IC	
		(TRANSISTORS)	
Q102	2SD1819A	TRANSISTOR(SI)	
Q103	2SD1819A	TRANSISTOR(SI)	
Q104	2SD1819A	TRANSISTOR(SI)	
Q105	2SD1819A	TRANSISTOR(SI)	
Q106	2SD1819A	TRANSISTOR(SI)	
Q107	2SD1819A	TRANSISTOR(SI)	
Q108	2SD1819A	TRANSISTOR(SI)	
Q113	2SD1819A	TRANSISTOR(SI)	
Q114	2SD1819A	TRANSISTOR(SI)	
Q115	2SD1819A	TRANSISTOR(SI)	
		(CONNECTORS)	
CN2	PQJS12B33Z	CONNECTOR	
CN3	PQJS24X54Z	CONNECTOR	
		(CRYSTAL OSCILLATORS)	
X1	PQVBKBR3.58M	CRYSTAL OSCILLATOR	
X2	PQVCL3276N6Z	CRYSTAL OSCILLATOR	
		(LED)	
LED7	PQVDSML210LT	LED	
		(RESISTORS)	
R101	ERJ3GEYJ684	680k	
R102	ERJ3GEYJ394	390k	
R103	ERJ3GEYJ102	1k	
R104	ERJ3GEYJ103	10k	
R105	ERJ3GEYJ104	100k	
R109	ERJ3GEYJ102	1k	
R111	ERJ3GEYJ335	3.3M	
R112	ERJ3GEYJ335	3.3M	
R113	ERJ3GEYJ335	3.3M	
R114	ERJ3GEYJ335	3.3M	
R115	ERJ3GEYJ335	3.3M	
R116	ERJ3GEYJ335	3.3M	
R117	ERJ3GEYJ335	3.3M	
R118	ERJ3GEYJ105	1M	
R119	ERJ3GEYJ104	100k	
R120	ERJ3GEYJ104	100k	
R121	ERJ3GEYJ104	100k	

Ref. No.	Part No.	Part Name & Description	Remarks
R122	ERJ3GEYJ104	100k	
R123	ERJ3GEYJ272	2.7k	
R124	ERJ3GEYJ563	56k	
R131	ERJ3GEYJ103	10k	
R132	ERJ3GEYJ104	100k	
R133	ERJ3GEYJ474	470k	
R134	ERJ3GEYJ104	100k	
R135	ERJ3GEYJ103	10k	
R136	ERJ3GEY0R00	0	
R138	ERJ3GEYJ334	330k	
R139	ERJ3GEYJ223	22k	
R140	ERJ3GEYJ475	4.7M	
R141	ERJ3GEYJ475	4.7M	
R142	ERJ3GEYJ564	560k	
R143	ERJ3GEYJ105	1M	
R144	ERJ3GEYJ474	470k	
R145	ERJ3GEYJ475	4.7M	
R146	ERDS2TJ473	47k	
R147	ERJ3GEYJ823	82k	
R149	ERDS2TJ473	47k	
		(CAPACITORS)	
C101	ECUV1H220JCV	22P	
C102	ECUV1H220JCV	22P	
C103	ECUV1H390JCV	39P	
C104	ECUV1H330JCV	33P	
C105	ECUV1C104KBV	0.1	
C106	ECUV1H561JCV	560P	S
C109	ECUV1C104KBV	0.1	
C110	ECUV1H102KBV	0.001	
C111	ECUV1H102KBV	0.001	
C112	ECUV1H102KBV	0.001	
C113	ECUV1H102KBV	0.001	
C114	ECUV1H102KBV	0.001	
C115	ECUV1H472KBV	0.0047	
C117	ECUV1H103KBV	0.01	
C120	ECUV1H101JCV	100P	
C121	ECUV1C104KBV	0.1	
C122	ECUV1C104KBV	0.1	
C131	ECUV1H102KBV	0.001	
C132	ECUV1H102KBV	0.001	
C133	ECUV1H102KBV	0.001	
C134	ECUV1H102KBV	0.001	
C135	ECUV1H102KBV	0.001	
C136	ECUV1H102KBV	0.001	
C137	ECUV1H102KBV	0.001	
C138	ECUV1H333KDV	0.033	

OPERATION P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB3	PQWP3SC30BXH	OPERATION PC BOARD ASSEMBLY (RTL)	
		(LED)	
LED101	PQVDSML210LT	LED	
		(CONNECTOR)	
CN101	PQJS12B33Z	CONNECTOR	

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